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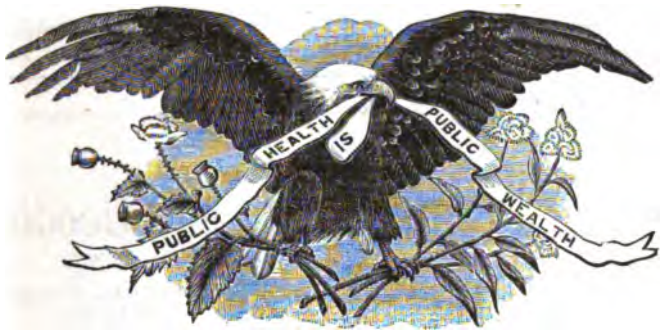

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JANUARY, 1888.

NUMBER 218.

THE PRESENT CONDITION, AND SUGGESTIONS FOR THE IMPROVEMENT OF THE NEW YORK QUARANTINE ESTABLISHMENT.

REPORT OF THE COMMITTEE OF THE NEW YORK ACADEMY OF MEDICINE.

AT the meeting of the New York Academy of Medicine held November 3d, 1887, J. D. Bryant, M.D., Health Commissioner of the New York Department of Health, read a paper entitled "How the Medical Profession Can Aid the Board of Health."

After enumerating several ways by which such aid might be given, he suggested as one of them the appointment immediately by the Academy of Medicine of a conference committee of not more than five of its members to confer with the Health Department on all matters of health relating to the general public when so requested.

The following resolution was then adopted by the Academy, to wit: That the President appoint a committee on conference, consisting of five Fellows of the Academy, including the President, to co-operate when requested with the Health Department, as suggested by Dr. Bryant. The following Fellows were appointed such committee: C. R. Agnew, M.D.; E. G. Janeway, M.D.; Stephen Smith, M.D.; R. H. Derby, M.D.; A. Jacobi, M.D.

On November 10th, 1887, a meeting of the Committee of Conference was held at the call of Dr. Bryant. The subject of cholera at quarantine was discussed, and descriptions were

given by Drs. Janeway, Edson, Biggs, and Prudden of their explorations of Hoffman and Swinburne islands, and of the defects in the plant of those islands, and the difficulty, if not impossibility, of providing adequate shelter, classification, and disinfection of immigrants suffering from or subject to infectious diseases.

On November 15th, 1887, the committee again met, having been called together on receipt of a communication from the President of the Board of Health, enclosing notes from his Honor, the Mayor, and the Health Officer of the port. His Honor, the Mayor, having heard of the appointment by the Academy of Medicine of the Conference Committee, requested such committee "to make an early examination of the quarantine establishment; to point out its defects and its requirements, in order to bring it up to the highest ideal standard of modern scientific and medical knowledge; to estimate the amount which will be required to be appropriated by the State in order to complete the necessary improvements, and generally to suggest whether the city of New York should provide any further temporary hospitals, in case there should be an outbreak of cholera in our midst."

In view of the emergency made by the note of his Honor, the Mayor, the following telegram had been sent previously to the meeting by the chairman:

"NOVEMBER 16, 1887.

"*Dr. William M. Smith, Health Officer, Quarantine Station, Staten Island.*

"The Conference Committee, Academy of Medicine, desires to inspect quarantine with you to-morrow, Thursday. Name hour, and whence."

Reply:

"QUARANTINE, November 16, 1887.

"Pleased to meet you at Clifton Station to-morrow morning at any hour you please to name.

"WILLIAM M. SMITH, *Health Officer.*"

Owing to conflicting professional duties, some of the committee could not go on Thursday the 17th. On Saturday the 19th the committee did make its visit of inspection, being

conveyed to quarantine on the steamboat Edson of the Health Department. All the members of the committee were present except Dr. Stephen Smith, who declined to go because he had recently visited quarantine. There were also present, by invitation of the committee, the President of the New York Board of Health, Mr. J. C. Bayles; Mr. Elnathan Sweet, State Engineer; Dr. H. M. Biggs, Pathologist of the Carnegie Laboratory, Bellevue Hospital College; Dr. T. Mitchell Prudden, Pathologist of the College of Physicians and Surgeons, New York, and Mr. Frederick N. Owen, engineer, Columbia College. Dr. Biggs and Dr. Prudden were added by vote of the committee to its membership at a meeting held on the return of the committee from its tour of inspection.

HOFFMAN ISLAND.

The first point reached in the exploration was Hoffman Island. It should be remembered that the quarantine establishment, port of New York, consists of the landing station at Clifton, Staten Island, where vessels arriving receive the official inspection of the Health Officer; and two miles below this station, in the Lower Bay, two islands artificially made of riprap and sand filling. The more northern of these islands, called Hoffman, is about two acres in extent. The more southern, nearly a mile distant from the former, is two acres and a half in size.* Hoffman Island, in the system of quarantine, is the place of detention. Off it detained vessels are anchored in the roadstead, and exposed there to heavy sea when the wind is on the coast. To this island passengers and their luggage are taken from detained vessels by a small steam tug, when, in the opinion of the Health Officer, their deten-

* Hoffman Island is two and seven eighths and Swinburne Island two acres, superficial area.—A. N. B.

tion is made necessary by prevalence among them of infectious diseases, or when such diseases shall have existed on the ships in which they have arrived. The sick are sent immediately to Swinburne Island to the hospital buildings which exist there.

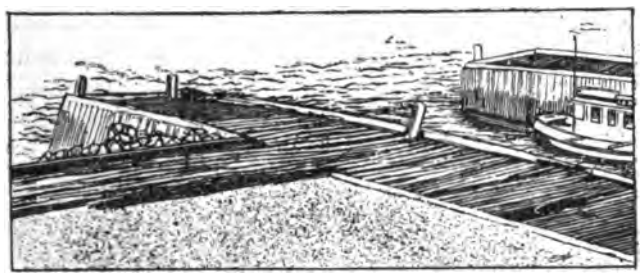
It is proper here to say that the quarantine property, land, buildings and plant, generally, owned by the State of New York is in the custody of a body called the Commissioners of Quarantine, appointed by the State and responsible to it. The Health Officer of the port, appointed by the Governor of the State and confirmed by its Senate, has no other control of the property and stations than that of police. He may use it without addition or modification, and so far only as may be necessary to enable him to discharge his duties in preventing the introduction into the port of New York of contagious diseases or infectious substances.

In regard to the question whether quarantine property and affairs should be under the jurisdiction of a National Government rather than a State Government, as now, the committee is not called upon to express an opinion. The committee deems its business to be to point out such defects of the quarantine establishment as are plainly apparent and easily remedied; to advocate such improvements in the plant at quarantine as would render it a sufficient safeguard for the port of New York and the country at large, if administered in a scientific manner.

As a related matter we would allude to the possible effect produced upon the business interests of New York and the country at large, if cholera were permitted to invade the dense population of the city. It is estimated that about one hundred thousand dollars a day are received by those hotels in the city of New York, from which people would flee if an alarm of cholera existed there. The amount of money received over the counters of shops from those who frequent the city to buy its innumerable wares cannot be estimated. It is millions. Hundreds of millions of dollars are annually produced in values in our various factories. To disturb the peace and industrial interests of the city, by permitting the irruption of cholera through defects in quarantine, would inflict an injury upon business beyond computation.

The time consumed in reaching San Francisco by railroad is

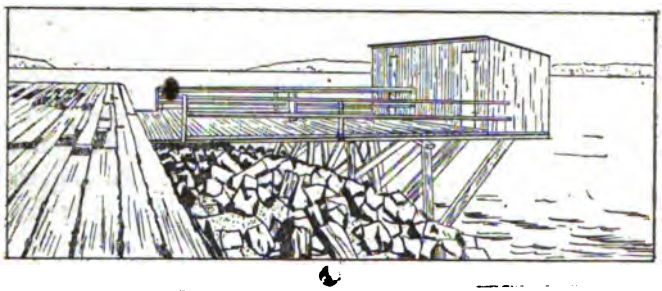
about that of the possible maximum period of incubation of cholera. The germs of any of the contagious diseases admitted into the port of New York by inadequate quarantine might be conveyed to any portion of the United States, fructifying as they went. Every citizen of the United States and British Provinces has, therefore, a personal interest in the condition of the New York quarantine. The existence of cholera in New York would cause the entire country to quarantine against the city. In this way interstate commerce would be paralyzed or seriously embarrassed. As regards the effect upon the health and death-rate of the people we cannot even surmise, as that question would turn on the efficiency of sanitary police. The law of cholera, its propagation, limitation, and extinction are so well understood that the disease may be said without presumption to be subject to scientific prevention or control.



PRESENT CONDITION OF HOFFMAN ISLAND.

With these few preliminary considerations, your committee would now in a cursory way call attention to some of the manifest defects in the quarantine establishment. In so doing they expect only to prepare the way for a thorough study of the subject. Thus steps may be taken to induce the Legislature, under appropriate law, to grant money enough to make quarantine what it should be. The plans to do this should be speedily prepared by the State officers. If there is neglect in this matter, and cholera, which has threatened to invade our port for more than three years, and has recently been brought to quarantine, should appear in the spring, and, favored by warm weather, pass an imperfect quarantine and reach New York City or Brooklyn, or possibly extend beyond

to near and remote places, public opinion would seek out the blameworthy and visit them with a condemnation which no seclusion would be deep enough to smother or mitigate.

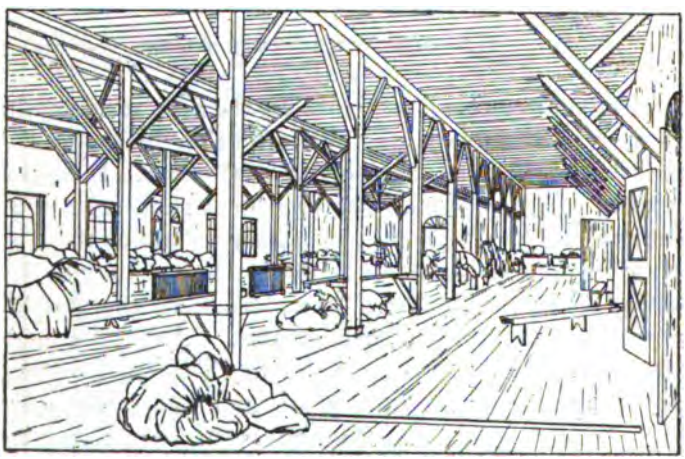


PRIVY OVER THE RIPRAP.

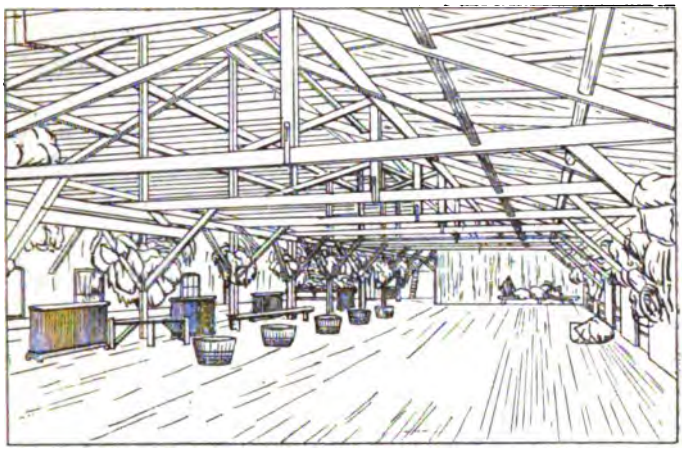
The ground is soft, uneven, full of recesses in which water, refuse, etc., will be retained without any chance of their being cleaned. The wood walks are in the worst possible condition—interrupted, broken, rotten. The riprap of only one half of the island is now supported by an inside wall of cement.

The present buildings used for the residence of the people quarantined are badly adapted for their purpose. They should be razed or remodelled.

There is now almost no adequate separation of ages, sexes,

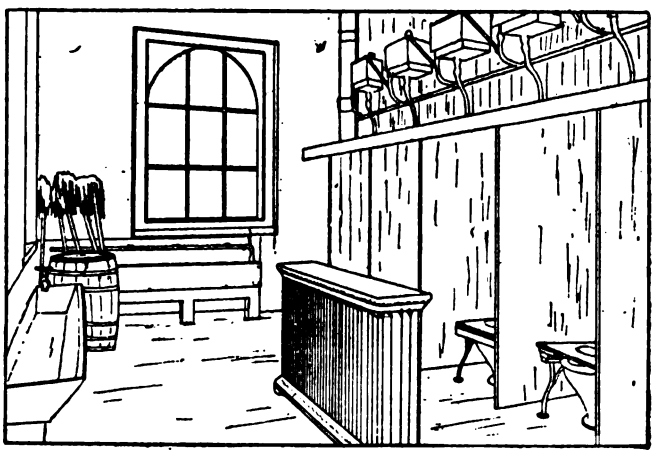


LOWER FLOOR.



UPPER FLOOR.

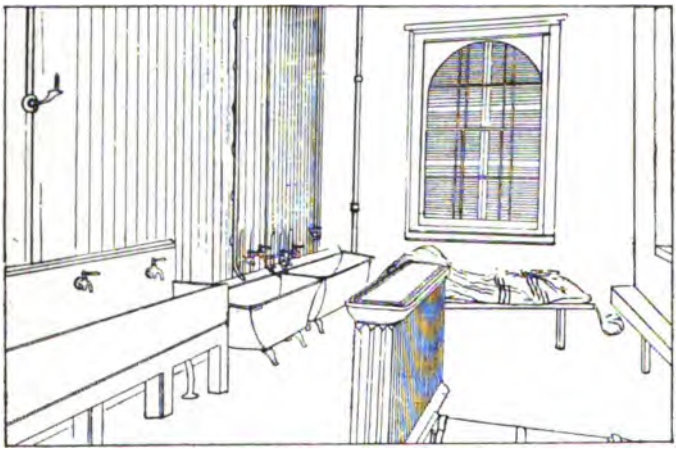
or families. No suspected groups can now be isolated. There is no opportunity at all to separate those who may be amply able and willing to pay. There are no proper accommodations, bedsteads, bedding, tables, forks, knives, spoons, plates, or towels. As an instance of the hardships caused by want of means of isolation, a steamer is at present detained at quarantine, owing to the passengers and crew having been exposed to small-pox. They cannot be taken on the island, as there is no subdivision of the Hospital of Observation.



WATER-CLOSETS.

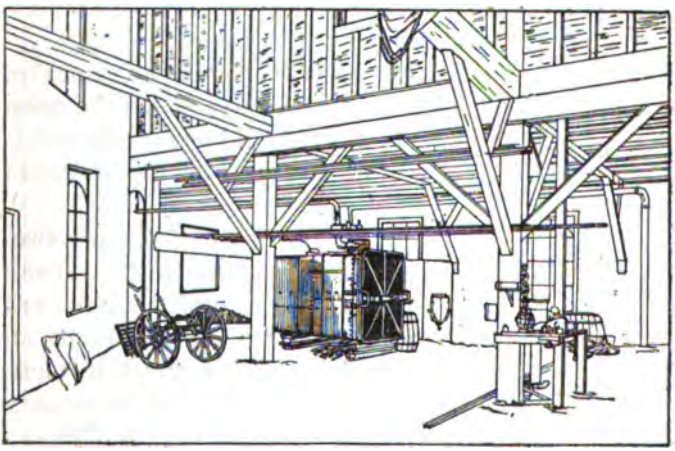
The supply of water is insufficient, and warm water is almost entirely wanting.

For a population now there of more than five hundred persons, there are about four water-closets, each closet having three or four hoppers, some of which are not flushed at all, and all of which are old, badly constructed, and out of repair.



BED IN LAVATORY.

The cleansing and disinfecting plant is entirely inadequate in extent and efficiency, thus making it impossible to cleanse



STEAM DISINFECTING PLANT.

the persons of the quarantined or disinfect their luggage, either expeditiously or thoroughly.

The "sulphur room" should not be where it is and as it is; for, being on the main floor of a building occupied by masses of the quarantined, the latter are constantly exposed to fresh infection from clothing brought in to be disinfected, and to the fumes of sulphurous acid when the door of the sulphur room is opened.

SUGGESTED IMPROVEMENTS.

Sea Wall.—The island must be protected against the inroads of the sea. This may be done as may seem best to the State Engineer.

1st. The riprap wall extending round the island should be made smooth and even to the water's edge.

2d. The concrete wall extending, at present, only part way round the island and inside the riprap should be completed.

3d. A solid wall of masonry, with smooth surface and steeply sloping, should be laid on the face of rough stones, either on the line of or within the existing riprap.

4th. A low wall might be built within the riprap, capped with stone or granite curbing, on which a broad walk should be constructed around the island.

An iron fence on the outer edge of the wall should extend entirely round the island; in order, first, to separate the occupants of the island from the riprap; and, second, to prevent access of strangers to the island.

Pavement.—The surface of the island should be cemented or asphalted, and should be raised sufficiently above the exterior wall to allow of good drainage. It should be smooth and hard to allow of thorough cleansing, and prevent the lodgment of filth or germs.

Docks.—The docks should be reconstructed, and two in number; the floorings made non-absorbent with concrete or asphalt. One should be for general use, and the other exclusively for the disinfecting plant. A covered landing stage should be constructed on the former, from which the sick on stretchers could be transferred to boats. A covered way should be provided from this dock to the large buildings and hospital.

It would be well to have a hand-car; and rails to be laid from the dock to the buildings.

Division of Island.—The surface of the island outside the buildings should be divided by a wall or iron fence into two distinct portions:

(*a*) The part adjacent to the boat-landing should be used for disembarking, disinfection, etc., and on this should be placed the cook-room and dormitory for employés and all other administrative appurtenances.

(*b*) The remainder of the island should be divided by walls into approximately equal areas, corresponding to the number of rooms for separate groups of people, each with a water front; and each one of these areas should be in communication with one only of the sets of apartments occupied by the separate groups of people.

It would be advisable to separate each of these yards from the water-front by an open iron fence, so as to leave a walk of about ten feet in breadth around the island, exclusive of the administration area. There should be on the outer or seaside of this walk another iron fence around the entire island.

Remodel old Buildings.—The present administration building, if retained, and one of the large buildings must be remodelled to answer for a new administration building, a disinfecting building, and a storehouse.

If the present large buildings are to remain, the roofs should be repaired; each main floor should be subdivided into two or more portions by solid partitions, to allow the grouping of the inmates according to age, sex, and relationship. Each apartment should have a separate entrance, and be thoroughly ventilated. This method should be condemned, however, unless absolutely unavoidable, as poorly ventilated apartments would result. The best plan and, in the opinion of the committee, the only sanitary one would be to construct new fire and filth proof buildings, tearing down the old ones as speedily as possible, or, if need be, one at a time.

Administration Building.—The present administration building should either be remodelled or a new one erected. Reconstruction will prove costly and unsatisfactory, and a new building would be better. It should contain the medical offi-

cers' apartments (who should also be superintendent) and quarters for an engineer, and with private kitchen ; also an extension on one of the docks, the disinfecting plant, storage rooms, laundry, etc., together with a furnace suitable for burning actually infected bedding, clothing, food articles brought in by infected passengers, kitchen refuse, etc.

Separated from these apartments there should be a large kitchen with accommodations for cooking meals for eight hundred or one thousand persons ; rooms for the attendants ; boiler room, containing at least two boilers for adequate power and security in case of accident to one ; engine, pumps, and apparatus for electric lighting. The sleeping and living rooms for the employés, together with three rooms for the resident physician, may be placed in a separate building.

The boilers should be of sufficient capacity to heat all the buildings, and to furnish steam in great abundance for disinfection, cooking, and washing. They should, if possible, be placed in a separate building, or the present one be devoted to their use.

Temporary Hospital.—There should be a small isolated building easy of access to the dock, where persons taken suddenly ill could be at once placed, prior to their removal to Swinburne Island. It should contain, at least, four rooms, to admit of the separation of the sexes and of diseases, and should be provided with two water-closets and two baths. The necessity for this hospital was recently illustrated by the simultaneous presence of measles, mumps, cholera, rheumatism, and pneumonia, and further made necessary by the great difficulty which attends conveying the sick from Hoffman to Swinburne Island in stormy weather, against opposing tide or with heavy sea.

Main Buildings.—The main buildings should be on the pavilion plan, of brick and iron with two stories. Each should have a central hall, from which wings should radiate at right angles. These wings should constitute rooms capable of giving six hundred cubic feet of air to each adult or to every two children, and of a size to accommodate twenty-five persons, with an extreme capacity of forty to fifty.

If isolated pavilions are decided on, there should be eight or ten, and each floor in some of them should be divided into

two or three small rooms for the isolation of small groups of persons, say four or six.

Cabin Passengers.—A separate set of rooms should be provided for cabin passengers, and for those who could pay for better accommodations.

Isolation of Classes.—The different pavilions should be isolated by walls. Arrangements should also be made for isolating the sexes. Connection between the stories should be prevented by having the entrances and staircases on opposite ends of the buildings.

Walls and Floors.—Particular attention should be given to the construction of the floors and walls. These should be made of as nearly non-absorbent material as possible, and concentrated or asphalted so as to be easily flushed and dried.

Cellars.—If the main buildings are retained, their cellars should be opened to allow free circulation of air.

If new pavilions are built, there should be a cellar under each, or air space with flooring of asphalt for ventilation, or chamber for indirect heat radiators, but not as a receptacle for goods, etc. The height of the ceilings of cellars should be sufficient for floor and wall cleaning, and for the placing of iron radiator boxes, and no radiator box should communicate with more than one heating flue and register.

Drainage.—Soil pipes and sewers should be of best construction, with absolutely tight joints, and should empty below low water. There should be a flushing tank of approved model provided for each line of sewer. *No sewage should be allowed to pass to the bay without being subjected to chemical treatment.*

Water-Closets.—There ought to be many water-closets in semi-detached buildings or small towers. If the latter, there should be nine buildings—eight for detained person and one for employés—or more than this if the passengers are divided into smaller groups. The floors and walls should be non-absorbent, and the apartments heated. The closets should be of a kind admitting of inspection of evacuations, of subsequent disinfection, and of thorough flushing. They should be flushed with a disinfecting solution pumped into their respective reservoirs by steam-pumps in the administration building.

Ventilation.—The ventilation of the pavilions, apartments,

and closets should be by fans and ample, and should be under the sole control of the authorized employés and not of the detained persons.

Lavatories.—The lavatories should be in semi-detached buildings, properly warmed and ventilated, and should contain stationary bath-tubs and a few portable ones, and in sufficient number to bathe five hundred persons in one day. They should also contain fixed basins of the most approved pattern, and in such number as to facilitate rapid use. Slop sinks should be provided in a separate apartment, and sinks for dish-washing should be off the dining-room.

Laundry.—The laundry should be in a building with accommodations for washing the bedding and clothing of eight hundred or one thousand persons; it should have stationary but not wooden tubs; also boilers, rinsers, wringers, and all the modern appliances supplied with steam. There should be a capacious dry steam drying-room, and all of sufficient capacity to pass through the clothing of eight hundred or one thousand immigrants in as short a time as possible.

Furniture.—Each pavilion or apartment should be provided with iron beds, wire mattresses, bedding, tables, chairs, etc., of the best models, the latter so that detained persons need not be forced to sit or lie upon the floor during the day. Bedding should be simple in quality, abundant in quantity, and kept scrupulously clean, and when not in use carried to a suitable place for airing and storage. Tickings filled with oat straw would make comfortable beds when placed on wire mattresses, and being inexpensive, might be emptied and contents destroyed and tickings washed after the discharge of the ship's company which had used them.

Utensils.—Dishes, spoons, knives, forks, and all such necessary articles should be provided, and should be kept in the custody of the employés except when in use, and be cleaned by the employés and not by the detained persons.

Meals.—If the present buildings are to remain, a space could be partitioned off in one corner of each of the large rooms, with accommodation for twenty-five or fifty sitting at a narrow table. They should be accessible from the hallway, not from the main rooms, and should be kept locked except during meals. With separate buildings or pavilions, provision

could be made in a central building for serving meals at separate tables to those in the different rooms.

Clothing.—Complete simple suits of clothing should be provided for the temporary use of immigrants during the disinfection of their own clothing and baggage, and such clothing should be carefully cleaned, or, in case of suspected infection, destroyed.

Towels.—There should be an abundant supply of towels for the wash and bath-rooms.

Disinfection.—The disinfecting plant should be located in a separate building near the water's edge. The plant should consist of two or more large iron cylinders or chambers. These should be lined with steam-pipes connected with a superheater, so that a dry temperature of at least 220° Fahr. could be easily obtained. It should be arranged so that moist steam under fifteen or twenty pounds' pressure could be introduced. The room in which the cylinders or chambers are placed should be divided by a non-absorbent partition into two parts, so that the opposite ends of the cylinders are in different rooms. The materials to be disinfected should be separated or individualized at one end and removed from the other, and this handling to be done by separate people. The drying-room should connect with discharging end of the apparatus. This arrangement might be made less expensive by lining the disinfecting chamber with steam-pipes to dry the materials after steaming without extra handling, and rendering the disinfection much more certain. The drying, as before said, might be done on the second floor of the building. The latter should be so capacious and the steam heating so provided that the result would be reached quickly and thoroughly.

Storage Warehouses.—There should be at least three storage warehouses :

1st. To be used for storing baggage not in use by the quarantined people.

2d. Located near the disinfecting building, to be used for disinfected baggage.

3d. For non-disinfected baggage, to be distinct from each of the other buildings.

Water-Supply.—The sources and collection of water needs careful consideration, as a plentiful and pure supply is of the

first importance. It would be wise to fill up the present cisterns and construct new ones, with every safeguard against contamination. The water used for drinking, cooking, washing utensils, dishes, etc., should be above suspicion, and, at stated times, critically examined. All collections of water should be carefully protected from surface drainage. Rain water for storage should be taken from roofs not liable to possible contamination. It would be well to provide for an emergency by having a large reservoir to which water could be brought in case of drought. Water for drinking and cooking might be brought in water-boat from the Croton supply.

Amusements.—Some provision should be made to relieve the tedium that must befall a large ship-load of passengers who, after encountering the dangers and sufferings of an ocean voyage, are unwillingly detained in full sight of their port for a considerable period of time, or it may be until the fact has been made clear that they are or are not to be victims to a dread disease. As a proper classification of the detained would necessarily prevent their use of a promiscuous hall of assembly, some simple means might be devised to keep up a good *morale* among them. Among these detained or quarantined passengers there will always be many who do not belong to the poorer immigrant class; for such there should be the possibility of acquiring some little luxury in the way either of food or entertainment.

Resident Medical Officer.—There should be at time of occupation a resident medical officer on the island, who should be superintendent, and also skilled in every detail of modern sanitary science.

PRESENT CONDITION OF SWINBURNE ISLAND.

The approach is defective, owing to a bar between it and Hoffman Island. It is difficult to land the sick, as there is no protection from the wind.

The present pavilions are too low on the ground, and with little or no air space beneath the floors. The floors of all the wards are defective. The ground beams are giving way, and there appears to be no ventilation underneath.

The wards are lacking in ventilation, there being no ade-

quate roof ventilation. At present the air currents are likely to be blown from one ward into another.

SUGGESTED IMPROVEMENTS.

Attendants.—Suitable accommodations should be provided for a minimum corps of nurses and attendants, and for the resident physician; with provision for enlarging the service quickly, and by the addition of persons of acknowledged character and skill. The resident physician should also be the superintendent.

Approach.—The bar should be kept dredged, or else a seaworthy shallow draught steamboat be provided that could make the trip from Hoffman Island at any stage of the tide or in any condition of weather or sea.

Dock.—The docks should be so arranged that boats conveying the sick could not only land at all tides, but also be protected from the waves when landing. A more protected covered way should be built from this landing to the hospital entrance.

Pavilions.—The pavilions should be raised for free circulation of air, and the ground beneath should be coated with non-absorbent material arranged for drainage, and capable of being cleansed. The floors of the hospital should be relaid and be made non-absorbent. The defects of the buildings from settling should be removed.

Ventilation.—There should be abundant ventilation; also a ventilator for each ward so constructed as to avoid the penetration of wind and rain—a matter of considerable importance in the exposed situation of the island.

Water-closets.—The water-closets should be like those proposed for Hoffman Island, with walls and floors the same.

The wards should be supplied with a stock of vessels suitable for receiving and disinfecting the dejecta of patients before they are committed to the sewer.

Disinfection.—There should be a complete apparatus for disinfecting, similar to the one proposed for Hoffman Island; also a furnace for burning infected bedding, clothing, refuse, etc.

Lavatories.—The lavatories should be sufficient in number,

properly heated, and be provided with baths for hot and cold water.

Morgue.—A new filth-proof morgue should be constructed, consisting of a room for storing bodies and another to be used for their disinfection, embalming, and for autopsies. These rooms should be well lighted and ventilated, have asphalt floors, smooth walls (non-absorbent), and all the necessary appliances for their purpose.

Disposition of the Dead.—The remains of patients who have died of contagious or infectious disease should be subjected to such processes as would render them, before burial, innocuous, and prepare them for a decay which would not imperil the living.

Danger from Fire.—The islands are small. The buildings are all most combustible. A fire occurring on Hoffman Island, crowded as it was last autumn, would have driven panic-stricken men, women, and children into the sea. This danger is equally great on Swinburne Island, though it is probable that the crowding there will never be so great. The more helpless condition of the sick, however, in hospital wards would increase their peril. The fire apparatus in both places is entirely insufficient. The limited area of each island would make any fire apparatus insufficient if the buildings happened to be crowded and a high wind were prevailing at the time of the conflagration. All buildings on such islands for similar purposes should be fire-proof.

We call attention before closing our report to the memoranda provided upon the request of the Chairman of the Committee by Mr. Frederick N. Owen, Engineer. The memoranda should be understood as preliminary to a more careful survey, and merely in the way of suggestions.

PHOTOGRAPHS.

Accompanying the report of the committee are sixteen photographs of Hoffman Island and its buildings.* They show the rugged and filth-catching quality of the riprap; the change going on upon the surface of the island; the broken

* Some of the photographs are different views of the same objects. The eight selected from which the engravings in the context were made fairly represent the condition.—A. N. B.

and decayed condition of the docks and plank walks; the state of the dormitories; the arrangements for bathing and disinfection; the rude and insufficient character of the water-closets; the want of capacity in the kitchen, and the extent to which large and highly inflammable buildings cover the greater part of the area of the island.

No photographs have been taken of Swinburne Island.

SUMMARY.

1. It is recommended that Hoffman and Swinburne islands be immediately put in suitable condition.

2. That suitable buildings and docks be erected upon them, and apparatus provided to make possible the disinfection, classification, and lodging of quarantined persons.

3. That suitable apparatus be provided for cleaning and disinfecting the clothing and luggage of the quarantined in a thorough and expeditious manner.

4. That suitable means for conveying the sick from Hoffman to Swinburne Island be provided.

5. That the hospital buildings of the latter be repaired or replaced by fire-proof structures, and placed under adequate medical supervision and skilled nursing.

6. That the water-supply be made sufficient and safe.

7. That the water-closets, bath-rooms, and general lavatories be provided in sufficient number and of the best model.

8. That the laundry arrangements be suitable and ample.

9. That suitable provision be made for the care and disposal of the dead.

10. The committee, while suggesting the changes that might be made on the island by remodelling the existing buildings, are fully convinced that it would be wise and economical to destroy them all, and erect fire-proof ones on a well-considered sanitary plan. In this way alone may the quarantine establishment be made what it should be, and what the country demands it shall be.

His Honor, the Mayor, asks the committee to "estimate the amount which will be required to be appropriated by the State in order to complete the necessary improvements."

To comply with this request with any degree of accuracy, it would be necessary to obtain plans from engineers and archi-

tects, which your committee have not the means of accomplishing.

To provide such a quarantine as the port of New York requires, and as would bring it up to the "highest ideal standard of modern scientific and medical knowledge," would involve the expenditure of a large sum of money, even under the judicious supervision of such a competent officer as the State Engineer. Nevertheless, there should be no unnecessary delay in carrying on the work. The discussion whether quarantine should be under National or State jurisdiction should not retard it; if the quarantine plant provided is "up to the highest ideal standard of modern scientific and medical knowledge," the National Government would reimburse the State for its outlay should the jurisdiction be changed. To wait to settle such a question and other questions of a political kind before providing a suitable quarantine establishment for the port of New York would neither be wise nor safe.

Finally.—To comply fully with the request of his Honor, the Mayor, the committee would say that a commission should be formed to consist of the State Engineer, the Superintendent of Public Works, the Mayor of the city of New York, the Mayor of Brooklyn, a representative from the New York Board of Health, the Health Officer of the port, and the Commissioners of Quarantine.

It may be said that such a commission, consisting of nine persons, would be so large as to be embarrassing. The reply to this criticism would be that there are many conflicting interests to harmonize, and the presence in the commission of representatives of the several interests would be favorable to a rapid, thorough, and scientific adjustment of interests and the accomplishment of the great purpose.

All of which is respectfully submitted.

(Signed) C. R. AGNEW,
E. G. JANEWAY,
STEPHEN SMITH,
A. JACOBI,
T. MITCHELL PRUDDEN,
HERMAN M. BRIGGS,
RICHARD H. DERBY.

REFLECTIONS ON THE DEATH-RATE, WITH SPECIAL REFERENCE TO DUBLIN AND ITS SUBURBS.*

By Rev. SAMUEL HAUGHTON, M.D., Senior Fellow of Trinity College, etc.

HE began with the statement that every human being is born with these natural rights—liberty, air, water, food, heat, and light. The three most important are air, water, and food. Without air we can only live about three minutes; without water, about three days; without food, about three weeks. These we seek by instinct stronger than reason and claim by force, if needs be, but how slow has been our progress to recognize that all others have equal claims to them. For eighteen hundred years the Christian world accepted slavery, and even the aged Paul sent back a runaway slave, apparently unconscious of his equal rights to freedom. For one hundred and fifty years, ending 1851, a window-tax deprived millions of their fair share of sunlight and air, a tax as monstrous as that of Vespasian on urine. The supply of water to the poor has also been just as much restricted. In the last fifty years London has increased its supply fivefold, but the inhabitants have in the same period increased fourfold. At present the supply was described by the orator, from the point of view of an Irishman, as "good enough for Londoners," though not equal in quality to that of Dublin or Glasgow. But Ireland is not generally well off, and a water was named as once drunk when it contained as much ammonia as sewage.

The relation of the death-rate to density of population was then lucidly stated, with an apology for the necessary mathematical formulæ, which, though agreeable to the speaker, were, he well knew, hateful to a public assembly. Dr. Haughton explained Farr's formula, pointed out its error, and furnished the necessary correction. He then presented a table which he had prepared, showing the death-rate calculated

* Abstract of Address on Public Medicine before the British Medical Association, August 4th, 1887.

from the densities, from which it is easy to see at once the proper average death-rate, and how far it deviates from that of health. He found that in certain sparsely populated districts, some million of country people had ten thousand less funerals to attend in a year, and then he described them as a dull race, who did not live but vegetated, ignorant of Greek, Latin, Shakespeare, Newton—and he ought to have added, mathematics. He would prefer, he said, to live among livelier people, and take his chance of a share among the ten thousand extra funeral feasts.

He then showed the effect of sanitary measures in London, Edinburgh, and Dublin, showing that in the two former these effects were four times as powerful as in Dublin, although the last had excellent water. As to Dublin and its suburbs, he summed up another table in the statement that, for every thousand persons living in the overcrowded liberties and slums of Dublin, five more must die each year than in the suburbs; and then solemnly warned the latter, in a quotation they dared not dispute, that "the voice of their brothers' blood cries from the ground." This, he said, is the old story—the saddened lives and early deaths of the poor cry continually from earth to heaven, and at times the silent cry is answered. Then, when pestilence leaves its congenial haunts and carries terror into the homes of the rich, increased offerings come to the hospitals; but they are of no more value than the large sums poured into the temple-treasury of Jerusalem, because they are but sacrificed to the fetich of pestilence, wrung from the rich by terror as abject as their former selfishness was mean.

As to the quarrel between city and suburb, Dr. Haughton ventured on three lines of Horace, and when some of his audience looked bewildered, and others thought it a good time to vent their applause, he interjected a condensed translation—both are in the wrong.

Another interesting table showed the relation of death-rate to absence of heat. From this it appeared that a fall of temperature from 40° to 32° F. means an increase in the death-rate of 5.6 for London, but of 8.9 for Dublin. The real cause of the high Dublin rate was attributed to the poverty of a large proportion of the inhabitants. It is, therefore, beyond

the control of sanitary authorities. It is always there, whatever the cause, and it calls for continual alms to relieve the suffering. The orator, who had enchained his audience throughout, closed with an effective appeal not to despair, but to bear in mind Peter's answer to the divine Lord, "Master, we have toiled all night and taken nothing; nevertheless, at thy word, I will let down the net."

CANCER IN MEDICAL EXAMINATIONS.

In a French work by Dr. Mauriac on medical examinations, translated by permission for the Insurance Record of London, we find the following observations relative to that terrible disease, cancer, which medical statistics show to be on the increase. Its hereditary transmission is proved as categorically as that of scrofula, or consumption, or madness. According to Lebert and Lafont, it would break out in fifteen cases out of one hundred; according to Velpeau, in over thirty-five out of one hundred. Cancer will not unfrequently multiply in the same family, and one of the most remarkable instances is told by Warren: the father had died of cancer in the lip, the son had one in the breast, and two of the daughters were also afflicted. Broca had, in one family, sixteen deaths from cancer out of twenty-seven—persons over the age of thirty. The tendency of cancer is to break out in the same organ in the parents and in the children.

Cancer is, therefore, a disease of paramount importance in the question of life assurance; it would be as important as consumption, if it were as frequent, but although taking the second place in that respect it deserves the highest consideration on account of its gravity, and still more because of the singular coincidence which exists between the age at which people are in the habit of insuring their life and the age at which cancerous affections show themselves. It is truly and absolutely between forty and sixty that are observed most cases of cancer. The encephaloide is, however, a form met often before that period, and the frequency of which would increase, according to Paget, from infancy until old age. Two thirds of this species of cancer are found under forty years, and are nearly equally divided between the first four decennial

periods. The scirrhus is most frequent between forty and fifty; it is extremely scarce under fifty; the same occurs for opithilial cancer, which becomes very common from forty to sixty, and later seems to increase proportionally.

The insurance doctor is indeed very perplexed when he finds himself in the presence of a candidate confessing candidly that both his father and mother had died of cancer.

What must be his decision in such cases? Evidently it is one of those occurrences in which refusal, based solely on the probable, even imminent hereditary transmission, must be stated, and with the greater reason that we have not here, as in pulmonary consumption, a certain period of life over which immunity from the disease is almost certain. On the contrary, it is from the very moment of his proposal for assurance that the candidate runs the risk of becoming cancerous, and the risk will keep on increasing as he advances in life. The assurance would be less hazardous if a candidate born of cancerous parents, applied to a company in his early days, as there would then be some well-founded hope that he might escape the cancerous attack for twenty or thirty years. But at the critical age of forty to fifty, and even over, the chances of escape become weaker and weaker. The difficulty is often greater because it often happens that the individual predisposed to cancer does not show any morbid characteristics before the invasion of the disease.

The data of the problem are simple, and yet the solution is very perplexing. What must the physician do? Let us examine a few hypotheses. 1. A candidate, born of cancerous parents, is from thirty to thirty-five years of age, his health is and always has been perfect. He may be accepted. 2. The candidate of cancerous family has reached the age of from thirty-five to forty-five years with thorough good health and every probability that it will continue so, if he escapes the effects of hereditary transmission. None of his brothers or sisters, placed in the same conditions of age, have become cancerous. He may be accepted, particularly if he has older brothers or sisters who are exempt of cancerous affections. 3. In all cases outside of the two preceding ones, the physician must be extremely severe and always refuse the candidate.—*Insurance Monitor.*

CLIMATE AS A THERAPEUTIC AGENT IN PHTHISIS; WITH AN ACCOUNT OF THE CHIEF SANATORIA FOR PHTHISIS AT HOME AND ABROAD.*

By JAMES ALEXANDER LINDSAY, M.A., M.D., Physician to the Consumption Hospital, Thronemount, Belfast; Assistant to the Belfast Royal Hospital, etc.

I PROPOSE in this paper to consider four questions: 1. Does climate cure phthisis? 2. How does climate cure phthisis? 3. What climates cure phthisis? 4. What cases of phthisis are curable by climate?

1. Does climate cure phthisis? Yes, beyond question. To doubt this fact is to run counter to a vast mass of unassailable evidence, and to give way to an unreasoning scepticism. I have met and talked with cured consumptives in many parts of the world—patients in whom the existence of the disease had been diagnosed by competent authorities, and the genuineness of whose recovery was testified by a long life of vigorous activity. These instances of complete recovery are, however, less common than cases of relative recovery, by which I mean those cases in which the morbid process in the lung becomes dormant and the patient lives out his days, but with diminished vitality, and maimed, as it were, for the rest of his life. It is an extremely important question to determine how many of these cases of cured phthisis are contingent upon the patient remaining in the country and climate where the cure was effected—are, in technical language, relative to his environment; and how many are so complete as to permit of a safe return to the unfavorable climatic conditions which prevail at home. Every practitioner who sees much chest disease has had distressing cases of consumptive patients who have gone abroad and apparently been cured, but who, yielding to that piteous home-sickness which sometimes assails the

* Paper read before the Ulster Medical Society, February 2d, 1887.

stoutest heart and disregards the plainest admonitions of prudence, have returned home, and returned to die. I fear that in a large proportion of cases the cure of phthisis is contingent and conditional, and I do not think we can often regard without serious concern the return of a cured consumptive to those climatic conditions which originally produced or predisposed to the disease.

2. How does climate cure phthisis? Not usually by a single or specific quality of the air or by any definite combination of meteorological conditions. The old notion of "healing air"—viz., that the air by virtue of some inherent virtue exercised a direct local curative influence upon tubercular deposits—is a delusion. Bournemouth and Arcachon profess to cure phthisis by the balsamic emanations from their pine forests, but if such emanations have any influence (which is quite doubtful), such influence is but a small and unimportant factor in their general climatic effect. The nearest approach to a specific climatic influence upon phthisis is found in the action of the climates of high altitudes, which has been abundantly proved to depend mainly upon the rarefaction of the air. To sum up this branch of the subject, climatic treatment cures phthisis by removing the consumptive from the evil influences of unfavorable meteorological conditions and of an injurious soil, and by transferring him to a climate where fresh air, sunshine, and an out-door life may be freely enjoyed, and where, in consequence, the processes of respiration, digestion, and sanguification proceed with sufficient energy to combat successfully the hereditary tendency or individual proclivity to pulmonary disease.

3. What climates cure phthisis? There are very many sanatoria which have been *alleged* to cure phthisis, but it is a significant circumstance that, while every year introduces some new claimant to attention, it also witnesses the dropping from the ranks of some discredited impostor. Time was when Montpellier was the reigning favorite. It is now almost forgotten. Pau and Nice have quite outlived their once universal fame. Jersey, with its capital St. Heliers, once boasted great things, but we now know that its boasting was vain. The above losses of popularity have been amply justified, but other fluctuations of medical opinion and practice have been

more arbitrary. The most favored health-resorts of the past generation were Madeira and Egypt. They are both at present under a cloud, but it will probably be a temporary cloud, as, for properly selected cases, these noted and long famous sanatoria have very decided advantages. The chief feature of modern practice is the great and growing popularity of the high altitude stations.

The number of health-resorts for phthisis is so vast that some classification must be attempted, though no satisfactory classification has yet been suggested. In default of better, let us divide sanatoria into three classes: (*a*) The marine resorts. (*b*) The dry inland resorts. (*c*) The mountain resorts.

(*a*) The best marine resort, if I may so express it, is the ocean-going ship; on the high seas the peculiar features of the marine climate are enjoyed in perfection. Those features are great purity of the air and freedom from all sources of contamination, marked humidity, and very great equability, both as regards temperature and hygrometric condition. The general influence of ocean air is decidedly tonic, and improvement in appetite and gain in weight are almost universal on shipboard. The disadvantages of the sea voyage are—liability to sea-sickness, which is a serious difficulty in only two or three per cent of cases; the want of proper sleeping-room, and the consequent contamination of the air at night; and the absence of many home comforts. No consumptive should undertake a sea voyage unless he can afford to travel with tolerable comfort, pay for a roomy cabin, and have suitable companionship. The sailing-vessel should in nearly every case be preferred to a steamer, and the voyage to Australia or New Zealand *vid* the Cape of Good Hope, is the most adapted to the consumptive. The usual time of departure for Australia is September or October, but this is an unfortunate arrangement, as the invalid thus lands at the antipodes at the beginning of summer, the worst and most trying of the Australian seasons. A better plan is to set sail in July or August, so as to reach Australia during the charming and healthful time of spring. Sailing-vessels occupy from seventy to ninety days upon the passage. The sea voyage confers at least temporary benefit upon the great majority of consumptives, except those cases of great debility and prostration which should not be

sent to sea. In the course of my four long voyages I have had as fellow-passengers a vast number of consumptives, who, with scarcely an exception, were happy and comfortable at sea, gained in weight, and experienced an amelioration of all their worst symptoms. It is a dictum of most writers upon the climatic treatment of phthisis that hæmorrhagic cases should not be sent to sea. I greatly doubt the accuracy of this view. I have only known two cases of hæmoptysis occurring at sea, and neither proved serious. I am quite unable to understand any theoretical ground on which hæmorrhage should be apprehended on shipboard. When the sea voyage fails, the causes of failure are often obvious. Excessive debility, rendering the patient unable to accommodate himself to the novel conditions of life at sea, sea-sickness, longing for home, which is apt to be strong amid the solitude of the ocean wastes, an uncomfortable ship, an overcrowded cabin, and an improper dietary—these often retard or prevent the beneficial influence of the sea voyage. There is one important point, of which my experience has afforded me several melancholy instances—viz., the proneness to relapse on reaching land. The patient should be warned to practise great caution as regards diet, exercise, and general habits on landing after a long voyage. Nearest to the climate of ocean comes that of ocean islands, such as Madeira, Teneriffe, the Azores, Nassau in the Bahamas, etc. Cases that have been known to do well on shipboard may be sent to these resorts with tolerable confidence, the climatic conditions being similar. There is admirable accommodation at Madeira, and many cases do well there; but diarrhœa is so epidemic as to be known as the "island complaint," and no case of phthisis should be sent there in which intestinal troubles have been much marked. The climate is very soft and soothing, and grateful to those suffering from bronchial or laryngeal complications, but it is deficient in tonic influence, and its effect upon the general course of the disease is decidedly inferior to that of more bracing localities. Patients may be sent there who lack the necessary vitality to enable them to react to tonic climatic conditions. Of the drier and more tonic marine resorts, Algiers, Tangier, and Malaga are, perhaps, the best. The reputation of the Riviera is decidedly on the wane. Many

seasons are delightful, but often the mistral is exceedingly treacherous, and snow-storms are not unknown. The chief stations in the Riviera are Hyères, Cannes, Nice, Monte Carlo, Mentone, Bordighera, and San Remo. Nice has quite lost its old reputation, owing to the sudden changes to which it is subject. Cannes is a lovely spot, but inferior to Mentone and San Remo for the purposes of the invalid. Where much shelter is a desideratum, Mentone should be preferred. Otherwise, San Remo possesses the best climate in the Riviera. Algiers is a great favorite at present. It possesses a dry, sunny, warm winter climate, with complete immunity from frost and fog. There are very few days on which the invalid cannot enjoy several hours of out-door life, and the proportion of charming weather is far higher than upon the northern shore of the Mediterranean. Consumptives should in no case reside in the town, which is very dusty and a prey to evil odors, but should choose the suburbs, such as Mustafa Inférieur or the Village d'Isly, and, as spring advances, a change inland to the dry and bracing climate of Hammam R'Ihra or Milianah may be advantageously adopted. Tangier resembles Algiers in its general climatic features, but the accommodation is inferior, and it is a very dull place. Malaga has a very good climate, but there is nothing to do, and patients soon weary of it. Biarritz is an excellent place in autumn, but too windy for a winter residence. Arcachon suits cases where nervous irritation is marked. As regards the marine resorts in Britain, Ventnor, Bournemouth, and Torquay are the best, and I have given them in what I consider as the probable order of merit. Ventnor is the warmest and driest of these resorts. Bournemouth has more shelter, and suits cases which cannot tolerate the more decided marine flavor of the air at Ventnor. Glengarriff is probably the best winter climate in Ireland. Rostrevor has some local repute, but it has little to recommend it. There are some excellent marine resorts in California, of which Santa Barbara is the best known. The Californian coast in its southern parts enjoys a remarkable dry, bright, and tonic climate, well adapted for many cases of phthisis. Tasmania has a climate of great salubrity, but there are many very diverse climatic types included within the area of that small island. The west coast is stormy and

wet, and wholly unsuitable to the invalid. The southern coast is somewhat too windy. The best regions for the consumptive are the north and north-east shores, which possess one of the brightest, mildest, and most genial climates in the world. The coast region of Australia cannot in general be commended, being a sort of battle-ground for the breezes from the sea and the hot blasts from the interior, and the climate is in consequence fickle and stormy. The most favored region in Australia for the consumptive is the interior plain, of which I shall speak presently. The best marine resorts in New Zealand are Napier and Nelson. Speaking generally, the reputation of marine resorts has somewhat waned in proportion as the fame of the dry inland and the mountain sanatoria has increased. No marine resort is, I think, equal to the ocean voyage, where the latter can be enjoyed under the most favorable circumstances.

(*b*) The dry inland resorts. The best of these are Nubia, the interior parts of Algeria, the Orange Free State, and the vast interior plains of Australia, especially the Riverina of New South Wales and the Darling Downs of Queensland. I am inclined to rate very highly this type of climate in the treatment of phthisis. A large proportion of the cases of complete cure which I have known have been effected by a prolonged residence in some dry inland region, the cure being, without doubt, in nearly every case materially promoted by the adoption of an open-air life, plain diet, and simple manners. Of the four regions mentioned, probably the Orange Free State is the best, as it possesses an advantage over the others in being at a considerable elevation. But personal considerations will lead in many cases to the selection of Australia, and it is no small advantage to send the consumptive to the land where he will meet his own kith and kin, where the language, food, and manners of the people will be familiar and congenial to him, and where he may possibly find such remunerative employment as many induce him to settle permanently. Speaking broadly, I would send to Australia only those consumptives to whom a dry inland climate would be thought to be beneficial, advising them in all cases to avoid the coast regions, and especially the capital towns, to go inland at once, settle upon some farm or sheep station, and

make up their minds to a residence of at least two years. A large proportion of cases would thus be cured. To recommend Australia as a sanatorium for phthisis without keeping these points in view is to invite failure and disappointment.

(*c*) The mountain resorts. These sanatoria have sprung into sudden favor within the last twenty years, and their popularity grows yearly. The chief are Davos, Wiesen, St. Moritz, and the Maloja in the Alps; Colorado Springs and Manitou in the Rocky Mountains; Bogota, Jauja, and Huancayo in the Andes. The almost complete immunity from phthisis enjoyed by residents at high altitudes first suggested their adoption. The most important feature in the medical climatology of the mountain sanatoria is the rarefaction of the air, which promotes respiratory activity, the expansion of the chest, and the absorption of morbid deposits. The dryness, the purity of the air, and the freedom from organic dust are all of importance, but subsidiary to the atmospheric rarefaction. These sanatoria fall into two classes—the cold and the warm. In the Alps and the Rocky Mountains the winter climate is marked by perpetual snow and severe frost. In the Equatorial Andes the climate at high altitudes is one of perpetual spring—humid, warm, and vernal. The mountain resorts have proved most efficacious in the following cases: delayed recovery from pneumonia with threatening tuberculosis, chronic pleurisy with much of fibroid change, incipient catarrh of the apex, chronic tubercular phthisis, with good reaction and the retention of fair constitutional vigor, whether cases of primary disease limited in extent, or single cavity cases without tendency to extend. Hæmorrhagic cases do well, although the profession was long inclined to exclude such cases from the mountain treatment owing to the unfortunate influence which a false analogical reasoning had exercised upon them. The contra-indications against the adoption of this line of treatment are: Weak circulation, which is absolutely prohibitory, senile change, the *eretische constitution*, extreme debility, and marked and progressive emaciation. Moderate pyrexia is not a hindrance, while sweating and fluxive diarrhœa are usually relieved at high altitudes. Where the cold mountain resorts fail, the warm may often prove useful.

4. What cases of phthisis are curable by climate? I have

hitherto spoken somewhat dogmatically, as the general principles of medical climatology and the general characters of the sanatoria for phthisis admit of very precise statement; but in dealing with this last question—to which I have more than once been obliged to make incidental allusion—I desire to speak with that diffidence which becomes the therapeutist. In many cases there are few more difficult problems than to determine whether a given case of phthisis will respond to climatic treatment, and what type of climate affords the best hope of success. Speaking generally, only chronic cases with fair reaction are suitable for climatic treatment. If the disease has a well-defined onset, and threatens to run an acute or semi-acute course; if the patient steadily loses ground and shows no gain in weight or other sign of rally under treatment; if the process in the lung is progressive and there are no evidences of repair—in each and all of these cases the interests of the patient will be best served by vetoing climatic treatment. The patient will die soon and die anywhere, and he may as well be allowed to pass his last days amid the comforts and sympathies of home. Cases marked by circulatory weakness, with fast, feeble, fluttering pulse, slight cyanosis, and persistent coldness of the extremities, are very unfavorable for climatic treatment, and should on no account be sent to the mountains. Cases in which laryngeal or intestinal ulceration or renal complication have supervened upon the ordinary type of the disease should be allowed to die at home. Cases in which anæmia appears early, and is well marked, are unlikely to respond to climatic treatment. On the other hand, we see a vast number of cases of phthisis in which the onset is very gradual and the constitutional involvement for a long time slight. Such cases nearly always improve, even in this climate, under a system of high feeding, fresh air life, and cod-liver oil, and I entertain no doubt that a considerable proportion of them may be completely cured by removal to a suitable climate, and the adoption of a prudent mode of life. In determining the climate to be chosen, it used to be taught that the condition of the bronchial mucous membrane was the chief guide; that cases with much bronchial catarrh should go to a dry climate, cases with dry irritable mucous membrane to a moist sedative climate, and so on. I greatly doubt the

utility of this rule. Phthisis is not bronchitis, and all analogies for its treatment drawn from our knowledge of bronchitis are not merely unfruitful but misleading. In the therapeutics of consumption we have given up directing our medicinal treatment to the bronchial mucous membrance, and I am unable to see why we should still base our climatic treatment on a theory which we thus implicitly acknowledge to be unsound. Hippo, paregoric, and squills have almost disappeared from our treatment of phthisis; and climatic sanatoria, which soothe the patient's cough at the expense of his appetite and strength, must follow them into deserved oblivion. The consumptive does not die of his cough. He dies of progressive wasting. We have thrown aside expectorants and anodynes in favor of good food, exercise, and such aids to nutrition as cod-liver oil, hypophosphites, maltine, etc., and we must, when possible, choose climatic resorts which are tonic and stimulant rather than those that are mainly sedative. The vital point about any climate is, will it promote nutrition? In early uncomplicated cases with vigorous circulation I think the mountain climates offer the best hope. If the circulation be feeble, or if there be much nervous irritation, the choice will lie between the sea voyage and residence in such dry inland resorts as Upper Egypt, or the interior plains of Australia. The sea voyage has the great recommendation that it rarely does harm, except in those very advanced cases which are beyond the reach of all treatment. If the patient objects to the mountains and shrinks from the long sea voyage, I think Algeria or Morocco should be preferred to France or Italy. Let me say, in conclusion, that climatic change is a snare instead of a help, a curse rather than a blessing, if it be regarded as a complete therapeusis in itself, and as enabling the patient to dispense with the usual lines of treatment and his customary precautions. Climate is not a specific. At best it is only a condition of cure, and we may expect it to be effectual only when the patient's food, habits, occupation, and mode of life are wisely regulated so as to facilitate its beneficent influence.—*The Lancet.*

THE HOUSE IN RELATION TO PUBLIC HEALTH.*

By J. B. Russell, M.D., LL.D., Medical Officer of Health, City of Glasgow.

It may be said of space, in a literal sense—in it "we live and move and have our being." In terms of space we may express the main physical conditions of existence in the proportion in which they are shared by men under the varied circumstances in which they live. Our bodies fill a certain cubical space. The basis of this cubical space is the two dimensions of a certain area of the superficies of the earth. On this surface rests the air we breathe; on it falls the regenerating sunlight, and the rain which is the ultimate source of the water we drink; on it we build our houses and conduct the business of our lives. The proportion of the numbers in which we live upon it determines the proportion in which we share the prime physical conditions of health—air, sunlight, earth-space sufficient to give free play to those operations of nature which will keep our environment healthy if they are not overtaxed by the aggregation of men.

These relations of human life to space were recognized by Dr. Farr as soon as the vital statistics of England furnished him with the necessary data. Working upon the mass of facts presented by each successive census, as to the distribution of the population on the soil, considered in relation to the local incidence of mortality in the intervening decennia, he gradually constructed a physical basis for vital statistics and erected them into a science. He proved that the apparently confused local phenomena of mortality were subject to certain laws capable of exact numerical expression, and of reduction to mathematical formulæ. It became possible even to work out from the results of life under physical conditions thus exactly expressed for one local area the results of life under other

* A paper read before the Insurance and Actuarial Society of Glasgow, January 26th, 1887.

physical conditions expressed in the same terms for other local areas. The reflex effect upon sanitation was immediate and obvious. A theoretical standard of health was established, toward which the practice of sanitary science could work on precise lines. The results of this work could be measured and formulated at each census. The evils of aggregation had been measured. The object of sanitation was twofold—to minimize aggregation as an evil in itself, and to discover how to minimize the evils of aggregation in so far as and inasmuch as it is a necessary condition of civilized life.

Dr. Farr had to create a terminology for his new science. *Density* is the number of persons per unit of area on which they live. The unit may be square yards, or square miles, or square metres. Divide the population by the area, however expressed, and you have the number of persons per unit—the density. The *Areality* is the unit of area per person living on that area. The areality is, therefore, the reciprocal of the density. *Proximity* is a function of the areality. It varies in the ratio of the square root of the areality. Density, areality, and proximity are all founded upon the hypothesis that the population is equally distributed over the surface of the area on which they live. Each individual is supposed to be placed in the centre of a hexagonal plot of ground, and the area of this hexagon being known, the proximity or mean distance between each person can be calculated. The yard or the metre is the most convenient unit in which to express proximity. You will find the mathematical demonstration of these laws, with their formulæ, in the Report of the Registrar-General of England for 1877, p. 231, by Dr. Farr, and by a different method in the Scotch Registrar-General's Report for 1875, by Professor Tait, of Edinburgh.

Such were the precise methods of measuring and expressing the different physical circumstances of masses of people in relation to their comparative mortality and the incidence of disease introduced by Dr. Farr. The importance of this new method of dealing with vital statistics cannot be better shown than by contrasting the generalizations derived from a survey of the local incidence of mortality in England before and after Dr. Farr's investigations. In 1775 Dr. Price expressed his deductions from a review of the imperfect statistics of his day,

thus: "It may be stated in general that whereas in great towns the proportion of inhabitants dying annually is from 1 in 19 to 1 in 22 or 23, and in moderate towns from 1 in 24 to 1 in 28, in country parishes and villages, on the contrary, this proportion seldom exceeds 1 in 40 to 50." Expressing these data in the way more familiar to us, as death-rates per 1000 living, we shall better recognize how unhealthy the nation then was. They range from 53 per 1000 in "great towns," and 42 in "moderate towns," to 20 in "country parishes and villages." But such statements give us no idea of the physical circumstances associated with these death-rates any more than the terms "high fever," "moderate fever," or "feverishness" would enable us to estimate and compare the gravity of three cases of febrile disease. The physician nowadays would say that the temperatures of the cases ranged from 106° F. to 103° F. and 101° F., his datum point being normal temperature, or 98° F. to 99° F. Contrast Dr. Price's deductions with those of Dr. Farr when, in 1871, he surveyed the retrospect of the local mortality of England in the ten years, 1861–70. He says: "Now, excluding the London districts, about which there is some difficulty, we have seven groups of districts where the mortality ranges thus—17, 19, 22, 25, 28, 32, and 39. In the same districts the numbers of persons to a square mile are—166, 186, 379, 1718, 4499, 12,357, and 65,823. Thus in Liverpool, the densest and unhealthiest district in England, there were 65,823 persons to a square mile, of whom 39 per 1000 died annually. This series of facts may be put in a different way: the nearer people live to each other the shorter their lives are. Thus, the proximity of people in 53 districts is 147 yards, the mean duration of life is 51 years; in 345 districts the proximity is 139 yards, and the mean duration of life is 45 years; in 137 districts the proximity is 97 yards, and the mean duration of life is 40 years; in 47 districts the proximity is 46 yards, and the mean duration of life is 35 years; in 9 districts the proximity is 28 yards, and the mean duration of life is 32 years; in Manchester district the proximity is 17 yards, and the mean duration of life is 29 years; in Liverpool district the proximity is 7 yards, and the mean duration of life is 26 years. This is a determined law; and the duration of life being given in one set of conditions,

the duration of life in another set of conditions is determined from the proximities."

"The nearer people live to each other the shorter their lives are." Such is Dr. Farr's concise expression of the law of density. It is a correct and important practical deduction from the facts, but it must be applied with a clear understanding of the conditions thus bracketed together in one short expression. The basement of the law is this, that animal life contaminates its environments. In the process of living man defiles air, earth, and water. This defilement only becomes dangerous when his environment cannot cleanse itself, and this may happen either by shutting in the individual with some impervious structure or by the packing of individuals too closely together. But the aggregation of civilized men in communities involves not only the aggregation of their bodies but of their houses, and the erections required for the special businesses or employments, as well as the convenience, amusements, and other functions of their lives. All this means complicated structural obstructions to the access of air and sunlight. Some employments involve much more defilement of the surroundings than others. Manufactures entail smoke and noxious emanations of various kinds, differing in intensity and offensiveness according to the nature of the manufacture. From these considerations it follows—(1) that proximity does not begin to tell against health and life until it has passed a certain point; (2) that the same degree of proximity under different circumstances will have different degrees of injurious influence, *e.g.*, in a market town, in a cotton-spinning town, in a town depending on coal and iron industries. It is thus evident that an intimate knowledge of local conditions is necessary to make local comparisons of density, in relation to death-rate, consistent with the rules of inductive reasoning. The conditions of density must be the same in the localities compared.

But we must not exclude from review the practical object of the study of the laws of density in its relation to health. The conditions of density are the subject of the science and practice of public health; the efforts of sanitation are directed to the amelioration of the dangers of proximity. In certain degrees of intensity existing in towns, the units of the popula-

tion live so near each other that the *conditions* of density cannot be ameliorated. It must be attacked directly by the clearing out of the buildings they inhabit and the dispersion of their inmates. But the great mass of sanitary work consists in the enforcement of provisions which neutralize or impair the evil effects of aggregation. In this way local density may remain and yet health may be improved, or over large areas it may steadily increase and yet the standard of health be maintained or even raised.

These considerations are admirably illustrated by the vital statistics of England for the last four decades. The following figures show that while by the steady growth of the towns and the proportionate decay of the rural element in the population, the areality and proximity of the total population have been rapidly shrinking, the death-rate has never risen in proportion, and has in the last decade, when this shrinkage attained its acme, fallen most decidedly :

	Areality in Acres.	Proximity in Yards.	Mean Death-rate.
1841–50, . .	2.21	111	22.36
1851–60, . .	1.97	105	22.24
1861–70, . .	1.75	99	22.51
1871–80, . .	1.54	93	21.27

You will be apt to underestimate the value of a variation of a few modest decimals in the death-rate, but if you remember that in round numbers the mean population of England was 24 millions and a quarter in the decade 1871–80, you will not regard as insignificant an annual saving of 1.24 lives in every thousand in those ten years. It means 300,000 persons preserved to the nation ; and this, after all, merely suggests a long vista of the results associated with such a triumph of sanitation.

You will now understand how Dr. Farr's statement, that " the duration of life being given in one set of conditions, the duration of life under another set of conditions is determined from the proximities," holds true only when applied to the data of large areas and within one period of time. In his first investigation, founded on the mortality in the registration districts of London, for the 4 years, 1838–41, he found that " the mortality of districts increased as the 6th root of their densi-

ties," but from the data of the decade 1861–70, for all England, he found that it was "nearly as the 12th root of their densities." Obviously from the tabular statement, just submitted to you, the law of one decade could not apply to another. Sanitation is operating upon the local conditions from year to year, and unequally in different localities; but, by taking large areas, these inequalities are averaged, and an improved standard of health, during one decade, is found with a diminished areality and proximity as compared with the decade preceding.

The physical conditions of density may be classified in general under four terms—air, earth, water, and the house. Density without sanitary interference and control deteriorates all four, and in the deterioration each acts and re-acts upon the other. It must therefore be remembered that their separate treatment is more convenient than accurate. The common atmosphere is at once deteriorated by aggregation through the products of combustion in domestic fires and trade furnaces. The nature and quality of the fuel will modify this result of density: wood is less injurious than coal. Coal differs in smoke-producing tendency. The stringency and enforcement or neglect of acts for smoke prevention will produce local variations in the pressure of density upon health. The arrangement of the buildings, the width of streets in relation to the height of buildings, may be such as to promote or obstruct perflation of winds and general ventilation, so that the character of the local building regulations and their lax or stringent application will determine the influence of density upon health. So also with general police regulations as to paving and scavenging of streets and courts, and public cleansing in all its arrangements and detail. Here we pass into the region of earth. If filth and garbage are allowed to lie about, especially in the vicinity of houses, upon the bare soil, the earth gets contaminated. Leaking sewers, drains, and gas-pipes, ashpits, and conveniences with pervious bottoms, and otherwise defective in construction, all befoul the earth. The earth being foul, not only does the air resting on it reek with poisonous emanations, but all water-supply derived from wells becomes impure, and the air drawn from it through the basement area of houses into the rarified space within is noxious.

Rivers also soon become unfit for dietetic use in populous districts. We can thus recognize the supreme importance of such otherwise apparently insignificant details as the covering of courts and backyards with seamless pavement, the construction of ashpits, and conveniences for the reception of filth so as to be impervious, preventing exudation and excluding rain, the frequent removal of their contents, and free use of water and the scavenger's broom, in relation to the purity of earth and air in densely inhabited districts. By the neglect of these precautions the conditions of density may be developed in their deadliest form; they may be minimized in direct proportion to the degree of stringency of their enforcement. Of all the noxious conditions of density, not one can be so easily and so quickly removed as the impurity of the water-supply, and not one is so effective and certain in its baneful influence in all degrees of density. The inhabitants of a farm-house may in this respect be too near to each other just as truly as those of a large city, though with far less excuse. The poisoned well in a rural district may be as deadly as the foul river from which a city derives its drinking-water. But the diversion of the couse of a leaky drain, or the tapping of a spring beyond the area of the farm-steading, will cure the one effect of proximity at the cost of a few shillings, while only a water scheme involving an expenditure of millions of pounds will cure the other. Let the farmer or the Town Council get a pure water-supply, and this condition of density is at once removed. In the proportion in which it gives effect to the total incidence of density upon health in that locality, Farr's law, that "the nearer people live to each other the shorter their lives are," is thrown out in its comparative local application. Still, in the remaining fractions of the total incidence it remains as effective as ever. There is no doubt that in rural districts it is through the water-supply that density is mainly operative as an element in health. There is no doubt also that the introduction of pure water into towns summarily shuts the most direct access of the baneful physical conditions of aggregation to the vitals of the inhabitants.

We have now arrived at the special subject of this paper—"*The House in Relation to Public Health.*" I have adopted what must seem a rather circuitous route to get at my subject

in order to associate it in your minds with the great law of density in relation to death-rate. The house is one of the most important items in the conditions under which density operates upon health. You can readily understand how in the case of cities, where aggregation assumes its highest value as an element in the physical conditions of health, if from any cause the efforts of sanitation have been unequally effective in modifying the conditions of density, that condition which has been *least* modified will predominate. That the housing of the inhabitants of cities has risen to this position of predominance in every aspect—social, moral, political, and sanitary—no one can question. Nor are the main causes of this difficult to discover. In itself the house-space must in any investigation of the relation of space in general to public health take a first place in importance. It is that portion of space which this householder acquires as his own. It is cut off and enclosed by its walls. He decides that this portion is, in his opinion, sufficient for himself and his family, or at any rate as much of this sufficiency as he can afford to pay for. Within it he acquires a personal right of ownership and liberty of action in the use of it, which cannot be invaded without ample justification on the ground of public necessity or utility. Yet men spend not less than a third, probably nearly one half, on the average, women three fourths, and children, in their earliest and most susceptible years, practically the whole of their lives within the house-space. Outside the house the collective mind of the majority or their representatives is all-powerful. A Water Act will improve the conditions of health of those who opposed as well as of those who promoted it; so will a rigidly applied Smoke Act. Those precautions and operations of general sanitation, which I have previously described, benefit everybody whether they will or no. A good Building Act and Public Health Act may even secure that every house in the city is in itself sound in the physical conditions of health provided it be occupied and used in a proper way. But every householder has a freedom of choice of his house, and he may dislocate all the relations of health to house-space in the exercise of this freedom. In this way may a man's house not only express in the properties of space many things about himself, such as his social position, his

moral character, his intelligence, but it provides, so to speak, a material leverage to those abstractions which enables them to act upon the health of all the inmates. The fact that a man is poor, or drunken, or ignorant does not shut him out from the benefits of pure water, pure external air, general civic cleanliness, and sanitation, but singly or in combination they lead to his shutting himself and his family out of the blessings of a wholesome house. The result of these considerations is to prepare us for the fact that in cities the average house-space of the inhabitants has a closer relation to their average health than any other element or condition of health which is capable of statistical expression.

Here I must explain a curious difference in the use of words which exists between England and Scotland, which leads sometimes to much confusion in such discussions as the present. In England "house" has the meaning which "tenement" bears in Scotland, and *vice versa*. Hence the English data as to houses and their inmates are of no use as an indication of the house-space of families or persons; and as the English census gives no information as to the number of rooms in the house, which the Scotch census does, we cannot get for any English town the information which I am about to give as to the house-space of Scotch towns.

If we compare the death-rates of the eight principal towns of Scotland for the ten years 1871–80, with their densities, we find that there is no relation. The reason is that their areas are not populated throughout their whole extent. Glasgow has nearly built over the whole area assigned to it, but Aberdeen and Paisley have not. Consequently, while the densities of Glasgow, Aberdeen, and Paisley are 84, 18, and 16 persons per acre, their death-rates are 29, 22, and 28. If we take house-space as the basis of comparison, we find that in every mode of statistical expression it moves closely with the death-rate. The eight towns may be divided into two groups of four —Aberdeen, Leith, Perth, and Edinburgh have death-rates ranging from 22 to 23; Dundee, Greenock, Paisley, and Glasgow from 26 to 29. In the former group there are from 1312 to 1671 persons per 1000 inhabited rooms, in the latter from 1870 to 2054. In the former group the proportion of the total population living in 1 apartment houses ranges from

10 to 17 per cent; in the latter from 15 to 25 per cent. In the former group the proportion of the total population living in houses of 5 apartments and upward ranges from 27 to 15 per cent; in the latter from 14 to 9 per cent. In the healthier towns, with a narrow limit of variation in death-rates, taken individually the house-space does not exactly follow those variations, but in the unhealthy with a wide range of variation, the house-space and death-rate move inversely with exactitude. Glasgow stands alone with the highest death-rate, the highest number of persons per room, the highest proportion of her population occupying 1 apartment houses, and the lowest occupying houses of 5 apartments and upward. These facts prove beyond a doubt that the predominant factor in the health of cities is the proportion of house-space to inhabitants.

The relation between size of house as measured by number of apartments and the death-rate of these cities deserves special notice. You would observe that the proportion of the population living in 1 apartment houses is lowest in the healthy towns, highest in the unhealthy; while the proportion of the population living in large houses (5 apartments and upward), is highest in the healthy and lowest in the unhealthy towns. The combined result of these two variables is expressed in the average number of rooms per house. This may be stated, so as to avoid decimals, as the number of rooms in 100 houses, which ranges in the healthy towns from 496 to 298, and in the unhealthy from 285 to 234. This relation between small houses and a high mortality, and *vice versa*, is put beyond question by a laborious investigation made by Dr. Anderson, the Medical Officer of Dundee, who ascertained the number of persons living in houses of certain sizes in 1884, and classified the deaths for that year so as to determine the death-rate in those classes of the population for that year. He found that, without taking account of the deaths in the hospital or poor-houses and other public institutions to which the inhabitants of small houses retire to die, the mortality actually occurring in 1 apartment houses was 21.4 per 1000; in 2 apartment houses, 18.8; in 3 apartment houses, 17.2; and in house of 4 apartments and upward, only 12.3. It is a moderate estimate to suppose that if the deaths in institutions could have been distributed to the houses from which the persons were removed,

the mortality in 1 apartment houses would have been found to be double that in houses of 4 apartments and upward.

If we divide cities into districts, we find the same general relation between house-space and mortality. In Glasgow, for example, taking the statistics of the three years, 1880, 1881, 1882, and passing in review the 24 statistical districts into which it is divided, we find "Blythswood" and "Kelvinhaugh and Sandyford" at the top with the lowest numbers of inmates per room, the lowest proportions of 1 apartment houses, the highest proportions of large houses, the *lowest death-rates;* and the "High Street and Closes (E)" and "Bridgegate and Wynds" at the bottom with the highest numbers of inmates per room, the highest proportions of 1 apartment houses, the lowest proportions of large houses, the *highest death-rates.* In the intervening districts the relative movements of room-space and mortality do not exactly coincide, but the discrepancies are accounted for by variation in the actual value in cubic space of the unit "room" in the districts. The main cause of this variation is, that houses erected at different periods follow a different scale of dimension of apartment. Taking the mean air-space in houses of 1, 2, and 3 apartments of various periods, it is found that in the oldest houses the mean value of the room is 1007 cubic feet, from which there has been a gradual rise to 1322 cubic feet in the most recent and best class of house. In the suburban burghs, which are all of modern growth, the "room" represents a uniform scale of space, and consequently the death-rate is found to advance, *pari passu*, with the number of persons per room, from Pollokshields with only 627 persons per 1000 rooms and a mortality of 10, to Kinning Park with 2446 persons per 1000 rooms and a mortality of 23. Even in Glasgow, with all its local differences in the cubic value of the room, if we take the mean-house for the whole city and arrange the 24 districts according as their houses are above or below this mean in size and occupancy, we find that we have also got a fair division of the districts above and below the mean death-rate. If we take the mean size of house measured by rooms as the dividing line, we find that above it we have got the districts with low death-rates, and below it those with high. If we take the mean number of persons per room as the dividing line, above

it we get the districts with high rates and below it those with low.

The references which I have made to the uncertain value in cubic space of the unit "room" must have directed your attention to the weak point in this endeavor to establish a relation between house-space and health. The unit of house-space which I employ is "a room." It is the only standard of measurement available. The only exact unit is the cubic foot. If I could ascertain the cubic contents of every apartment in every inhabited house and divide the total by the number of inhabitants, I should then be able in one short statement to exhibit to you the relation of the house to public health. In the absence of this precise information, I am compelled to get as near to it as possible, and by various indirect paths to work out this relation. We have seen that the room varies in cubic capacity with the period of erection of the house. In older houses the average room is less capacious than in more modern houses; but the relation of house-space to health is not finally determined by the absolute measurement of the house-space; it consists essentially in the relation of this space to the number of persons living within it. Here, again, instead of appealing directly to actual measurement of houses of different sizes, I must work round to an approximate answer to the question—What is the relation of cubic space to occupancy in large and in small houses as measured by the number of rooms? Does the same scale of occupancy prevail throughout? As you rise from 1, 2, and 3 apartment houses to houses of 5, 10, 15, and 20 apartments, do you rise in relative proportion in the number of inmates? The exact question of course is—Have the inmates of large houses increased in proportion to the increase of house-space? or, is it the fact that the larger the house, the larger the average proportion of house-space to each inmate? The only available unit of measurement of house-space being the "room," I must ask you whether, as a matter of personal observation, it is not the case that the internal subdivisions of a large house are larger than those of a small one? Take 1, 2, and 3 apartment houses to represent the small house. I can tell you as a matter of fact that in modern tenements the room is a constant unit measuring 1200 to 1300 cubic feet, so that the 2 and 3 apartment houses are as to cubic space simply multiples of the 1

apartment house. In older tenements there is a little gain per room in cubic space in the 2 and 3 apartment as compared with the 1 apartment house; while in the oldest, those in the High Street and Salt Market, for example, there is a loss per room—*i.e.*, the half or the third of a 2 or 3 apartment house is less than the 1 apartment house. But take your own eye-measurements of rooms in small houses and compare them with those of rooms in large houses, whether in flats or in self-contained lodgings, and I think you will grant me this proposition: *The unit room in large houses has a much higher cubic value than the unit room in small houses.*

The next step in the process of induction through which I desire to lead you, I think I can prove. Referring again to the large towns of Scotland, I have calculated for each the average number of persons found at the census in each 1 apartment house and in houses of 5 apartments and upward. To avoid decimals, I shall state the number of persons in 10 houses of each size. In Aberdeen there were in every 10 houses of 1 apartment 24 persons, in every 10 houses of 5 apartments and upward, 69 persons; in Leith there were 30 and 63 persons; in Perth 23 and 68 persons; in Edinburgh 27 and 66 persons; in Dundee 27 and 112 persons; in Greenock 32 and 70 persons; in Paisley 34 and 75 persons; in Glasgow 31 and 78 persons. The number of persons per room and the number of rooms per average house is another aspect of the same facts. It is more complete, because it combines the average result of houses of all sizes in each town in one view. If we range the mean number of rooms per house in each town from the highest to the lowest, we find that the mean number of persons per room rises exactly as the mean size of house falls. At the top is Perth with 496 rooms per 100 houses, and 1312 persons per 1000 rooms; at the bottom is Glasgow with 234 rooms per 100 houses, and 2054 persons per 1000 rooms. We get the same inverse ratio between size of house and occupancy in the 24 districts of Glasgow and in the nine suburban burghs. From these facts I deduce the following "Law of Occupancy:" *The smaller the house as measured by rooms the greater the number of inmates per room, and,* vice versa, *the larger the house as measured by rooms the fewer the number of inmates per room.*

Now, I have proved by actual measurements that the unit

room in small houses of modern construction, which constitute the largest proportion of the total existing houses in Glasgow and large towns generally, and thereby make the law, is of nearly uniform size, so that 2, 3, and 4 apartments are multiples of the 1 apartment as to cubic space. You have granted the proposition that the unit room in large houses has a much higher absolute cubic value than the unit room in small houses; therefore, I make my last inference, that: *The smaller the house the less the cubic space per inmate, and,* vice versa, *the larger the house the greater the cubic space per inmate.*

These are the laws which govern the relation of the house to public health. You will remember that in speaking of density, areality, and proximity in rural as compared with urban districts, I remarked that there was a certain range within which they became effective. Dr. Ogle has made reference to this fact in classifying the districts of England into groups according to their mortality in the ten years, 1871–80. He begins with a group comprising rates under 15, and ends with a group comprising rates over 27, but under 34. It is not until we pass above a density of 217 persons per square mile, and a death-rate of over 19 and under 20 that the density and mortality move upward together. He remarks: "It is not apparently until the density has reached a certain degree of intensity that it begins to exercise any appreciable effect. This, indeed, might have been anticipated. For though we can readily understand that in crowded communities it may be a matter of vital importance whether there are 500 or 1000 or 2000, or more persons living on a square mile, yet it can scarcely make any difference, so far as health goes, whether in rural districts there be two acres or three acres on an average to each inhabitant. The differences in the death-rates in these sparse populations are determined by other conditions than aggregation." (P. xx.) The same fact is apparent in house-space. It is only in the suburban burghs around Glasgow that we can find districts wholly of large houses and wholly of small houses, in both cases of modern construction. Pollokshields has houses averaging a little over 11 rooms, each inhabited by .627 persons, and a death-rate of 10. It is followed by Hillhead, with houses averaging between 6 and 7 rooms, inhabited by .830 persons per room, and a death-rate

of 10.5. Crosshill comes next, with houses averaging between 5 and 6 rooms, occupied at the rate of .929 persons per room, with a death-rate of 12. Then follows Pollokshields (E.), with something over 5 rooms per house, 1.071 persons per room, and a death-rate of nearly 14. Afterward the size of house diminishes, the persons per room increase, and the death-rate rises until we reach Kinning Park, with scarcely 2 rooms per house, between 2 and 3 persons per room, and a death-rate of 23.3. House-space seems therefore to become a predominant factor in the health of an urban district when we approach an average house of 5 apartments, and a mean occupancy of more than 1 per apartment. In short, there is an amount of space both inside and outside the house which is only a luxury, but when space in either case shrinks within a certain limit it becomes a necessary. In other words, *space is a commodity which is used only as a necessary of life by the wage-earning classes, but is used as a luxury by the wealthy.*

If we review these conclusions, to which I have led you step by step, it will be apparent that health and wholesomeness in small houses depend upon a very delicate adjustment of circumstances. The margin between health and disease in the structure of the house, and in the use of its contained space, is a very narrow one. The smaller the cubic space in which a man lives the more difficult it is, even with the *best* mechanical contrivances, to renew the air within it sufficiently without draught. In a laboratory experiment it has been shown that perfect ventilation of a space of 424 cubic feet can be maintained. With the best conceivable arrangements in a house, 600 cubic feet could be renewed sufficiently without draughts. These ideal conditions will give you some conception of how far short of perfection the ventilation of the ordinary small house must fall in practice, even with a carefully regulated occupancy; but we have seen that the tendency to overcrowding grows as the house-space diminishes. The evidence that the supply of this necessary of life is in fact less than health demands is found in the mortality rising as the average space falls, and especially in the large proportion of deaths from diseases of the lungs, in all urban communities where small houses most abound.

Let us run over the conditions required to secure the whole-

some occupation of tenements of small houses. They must be carefully planned and built. Those small houses must start with the best practicable structural arrangements and sanitary provisions. There is no available margin of space about them which will neutralize any defects in original structure. Their contained air must be put in the best attainable circumstances both as to renewal and as to reducing contamination to a minimum by efficient drainage, water-supply, and the removal of refuse. Supposing such a tenement thus originally well ordered, it must, when occupied, be carefully maintained. It works like an engine driven to the full extent of its horse-power. It is always bursting with life from rooftree to foundation. Every part of its movable working apparatus, and even its solid structure, is under strain. The inhabitants will not in general by their habits reduce the tear and wear, but "a stitch in time saves nine," and it is not only necessary for health's sake, but economical for the proprietor's, to be watchful and ready to maintain the structure and appliances of tenements of small houses. Supposing the structure and maintenance to be perfect, the mode of occupation must be regulated. The condition of wholesomeness lies essentially in the due proportioning of inmates to cubic space. The houses are in the market, but health is at stake in the choice made by the buyers. Every tenant in making his selection has on the one side of a line drawn by the laws of the universe, health, and, on the other, disease. Experience proves that the occupants of small houses cannot be left to their freedom of action in this matter. There is a moral responsibility on the landlord in the first place, and failing him upon the authorities somehow to direct and determine their choice. Supposing this difficulty overcome, can the tenement thus properly built, maintained, and occupied, be left without supervision as to occupancy? I answer, no. Physical and moral chaos will gradually invade the original order if an eye, either the eye of the landlord or the sanitary inspector, is not kept upon the householders to prevent overcrowding.

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Now, let us take the case of Glasgow, and for the sake of illustration consider what is done and what is left undone in promoting the conditions of health in tenements. As to their original structure, new buildings are erected under the

powers of the Dean of Guild Court. These are notoriously defective. I say notoriously, because repeated efforts have been made for years to have them extended and amended, but without success. Watch, for example, the Glasgow builder digging his trenches for the walls of his tenements, and laying the joists of his basement floors over the grass or the bare soil. He cannot be compelled to clear away an open space, to put ventilating openings through the main walls into this space, much less to exclude the emanations from the soil by covering it with asphalt or concrete, or to prevent the surface water from passing up the walls by a damp-proof course. He need not show his drains and soil-pipes in his plans, and if he does he cannot be made to submit them to inspection before he covers them up. Time would fail me to enumerate the defects in our building regulations—these are a few examples. But it may surprise you to be told that a large proportion of our smallest houses are never submitted to any regulation at all. They are provided by a process known as "making down" large houses. The owner of a self-contained lodging or a tenement of large flatted houses finds that there is no demand for such accommodation in the locality; he forthwith throws open or takes off the front door, and lets the rooms of the large houses as 1, 2, or 3 apartment houses; he may even pass his plans for large houses, and next term begin the process of "making down." This process, carried on from time immemorial, has created the most puzzling of all the sanitary problems of house accommodation in Glasgow. We must pay now in improvement rates for the ignorance of our forefathers, but the pity of it is that we are helpless witnesses of the same mischief-making now. A tenement ought to be an edifice carefully planned for a certain mode of occupancy and number of inhabitants. You cannot alter the mode of occupancy and multiply the number of holdings and inmates without dislocating all the arrangement of parts and proportion of conveniences on which health depends. This is virtually the same as erecting a new building, and should necessitate the production of plans and the revision, under authority, of the whole tenement. At present a great part of the work of your sanitary department consists in improving such "made-down" houses when found to be "injurious to

health," by the tedious, expensive, and unsatisfactory powers of the Public Health Act. This cannot be called rational from any aspect.

As to the maintenance of tenements by the summary removal of the defects technically termed "nuisances," which arise in the ordinary course of tear and wear, this is regulated by the Public Health (Scotland) Act, passed in 1867—twenty years ago! Not a line has been revised or a word added to the general health legislation of Scotland for twenty years! I need scarcely say a word more under this head. It appears to me that "nuisances" occurring in tenements have a special gravity as affecting the health of so many persons always living on the verge of disease, and the law should provide the most summary process that can be devised for their removal. Imagine what a leaking drain is below a 1 apartment house, or a choked W. C. on a common stair giving access to 12 or 20 houses.

As to the regulation and supervision of the mode of occupation of small houses, we are better off in Glasgow under the powers of our much maligned local Police Act. The principle is there fully admitted, that in small houses the margin between health and disease depends upon such a close adjustment of occupancy to space, that even in the choice and use of their houses, the householders must be controlled and regulated. In the Local Act a minimum cubic space of 1, 2, and 3 apartment houses is fixed. Any such house may be measured, and if its total capacity does not exceed 2000 cubic feet, a ticket can be affixed on or over the outside of the door on which is marked the available space and the legal number of inmates. This is at the rate of 1 person aged eight years or upward, or 2 below that age to every 300 cubic feet. In the older parts of the city, all houses which can be "ticketed" are so. In the newer parts when overcrowding is discovered, as it soon is by fever, if by no other sanitary inspector, the landlord is first warned that if he retains such tenants his houses must be "ticketed." The tenants are at the same time advised to remove to larger houses. The inspection of these small houses is carried on at night all the year round. Many, however, are above the total cubic size which warrants ticketing; but if a house contains nightly lodgers, it comes

under the Common Lodging-House Regulations, provided the sum paid does not exceed 6*d.* per night; if it exceeds this amount, any house containing a lodger may be scheduled under the Public Health Act. The combined effect of these powers is, that a considerable proportion of the inhabitants of small houses live under close supervision, and many more are restrained by the fear of being subjected to this supervision. It will probably be news to many of you that at least 100,000 of your fellow-citizens live under physical conditions so perilously near to disease that the law has said those physical conditions must be prescribed and maintained. Every night in the year inspectors are out knocking at their doors, counting the people as they lie on their beds, or under them, or on the floor. It seems strange to think that under no other conditions can they be got to live in some measure of consistence with their own health and the safety of the community. In the overcrowded houses there are on an average 6 persons per room, of whom 1 or 2 are lodgers, and the average house-space is less than 200 cubic feet. The opinion of the authorities is, that the minimum size of 1, 2, and 3 apartment houses should be raised from 900, 1500, and 2000 cubic feet to 1200, 2000, and 2400; and that the standard of occupancy should be 400 instead of 300 cubic feet. We failed to get this and many other special powers necessary to the peculiar conditions of a large city through amendment of our Police Act, because the Lord Advocate desired uniformity, and we failed to get them through the Burgh Police Bill, because it was impossible to apply the same stringent laws in Auchtermuchty as in Glasgow! Even 400 cubic feet is a poor standard. In New York it is 600, and that in new buildings erected with a detail of attention to general structure, ventilation, drainage, and plumbing, as prescribed in the Tenement House Act, 1879, which might be studied by us with advantage.

Such is my idea of the method of securing fairly wholesome accommodation for the inhabitants of small houses. Let the houses be constructed with intelligent foresight of the conditions of health, let them be maintained with care, and occupied with supervision, so that in their use they may not be made unwholesome. In geology there were at one time two rival theories, in accordance with which it was sought to ex-

plain the facts. One was the paroxysmal or cataclysmic, the other the doctrine of uniformity. According to the former, the configuration of the earth was worked out by spasms of excited action—the mountains were thrown up by earthquakes, and the plains laid out by deluges. According to the latter they were formed gradually by constantly acting forces of cold and heat, rain and wind, the gentle but not less powerful agencies which we still see everywhere active. In public health there are also two schools. The one takes periods of indifference and repose, then wakes up under the stimulus of some great epidemic or political revolution to the evils which have grown meanwhile, and plunges into paroxysms of eccentric activity. The other never sleeps, but works quietly from day to day, making and keeping things right. There is no department of public health in which those two schools exhibit their characteristics better than in that which deals with the housing of the poor. I belong to the uniformitarian school. If you fall asleep and leave the poor under the influence of their ignorance and improvidence to settle down in the nearest kennel, and allow the kennels to multiply, you soon have a condition of things which can only be removed by improvement schemes and gigantic displacements—thousands are thrown into the street at once. In such circumstances as those of London, where a community of four millions has the stable residential adjustment of its families suddenly disturbed, the result is to inflict untold hardship upon the poor. The social fabric is convulsed, and the "Bitter Cry of Outcast London" appalls the ear. In despair the philanthropist develops all kinds of schemes, which the moralist and political economist condemns because of the greater evils which they see in the future. I have told you that a man's house expresses in space many things about himself, such as his social position, his moral character, his intelligence, and that it provides a material leverage to those abstractions which enables them to act upon the health of all the inmates. In short, we are living under moral government, and no one who looks beneath the surface of the misery of small houses can fail to recognize that there is in it a disciplinary element; there is, at any rate, too much of this element to make it safe to attempt to remedy it from the outside; it must be remedied

through the householder, by constant pressure upon the man as a rational and responsible being. Nothing will help him to thrift and self-restraint so much as the fact that there are no miserable houses to be had. It will always be that if there are miserable houses to be inhabited there will be miserable people to inhabit them ; the two get together as certainly as drops of water coalesce if brought into proximity. There are streets and districts of tenement houses in Glasgow which are well up to the practical requirements of health, and the inhabitants are well up to the average standard of morality and well ordered life. There are streets and districts of houses which are miserable in the material conditions of health, and their inhabitants are in the main like their houses—they have got together because the houses are there, and their ignorance and improvidence—often their vices and immorality—drive them there, and there they find congenial neighbors. As has been said : " In crowded districts, where the lower orders are neglected and life is cheaply estimated, if tubs were ticketed ' to be let,' they would soon be tenanted by the most wretched." If we build houses at the cost of the ratepayers and give them to such people, we are relieving them, or most of them, at the expense of the well-doing, of the natural punishment of their ill-doing. If, on the other hand, we keep up the standard of house accommodation, we may lead the flagitious and improvident to mend their ways. The argument that unsanitary houses must be permitted because only such are within the means of their occupants is like that for winking at the sale of adulterated and unwholesome food because the poor cannot afford better and will starve. Both arguments are most frequently advanced by interested parties—the owners of unsanitary houses and the sellers of bad food.

It is a remarkable fact, that an essential part of every scheme for providing model dwellings for the wage-earning classes is the acknowledgment of this moral element in house accommodation. Not one of them provides for the actual inmates of the miserable houses—the people who are at the heart of all the social and sanitary troubles of cities. The tenants are selected. The model house is awarded to model people. They are strictly supervised by resident superintendents. No drunkard or vicious or immoral person is admitted

or retained. All material nuisances are at once repaired. If every landlord so acted, the disciplinary results would in course of time be marvellous; if every local authority had summary power to weed out and keep down unwholesome houses, and systematically exercised it, the disciplinary results would in time change the aspect of life among the poor. Any exceptional cases of poverty, by no fault of its own, would be met by the charitable and philanthropic agencies working on their present moral basis. We should hear no more of the unwholesome house being a social necessity or of rate-supported schemes, which must either be administered so as to fly in the face of the moral government of the universe, or so as to become nurseries of model parasites. In either case they would no more relieve us of our difficulties than the "Republic" of Plato, or More's "Utopia," or the "Hygeia" of Richardson. The "Bitter Cry of Outcast London" was essentially an indictment against the Local Government of London, not a demonstration that although everybody—the Legislature, the vestries, the landlords, the people—had done their duty, somehow everything had gone wrong; the rewards had drifted into the hands of the vicious, and the punishments had fallen upon the heads of the virtuous.

Gentlemen, when I was asked to appear before your Association, I shrank from the honor, because it is but a limited range of subjects which I can venture to treat before such an audience, and within that range I could not think of any which would be interesting to you. When at last I chose my present subject, I felt it would appeal to you as men of education and position, or promise of position, in society. I ask you to accept it, not as a contribution to your professional knowledge, but as a humble endeavor to enlist your intelligent interest in the social problems of your age and city. The facts which have engaged us to-night form the soil through which creep the roots of revolution and social anarchy, drawing to them the noisome elements on which they feed. I have dwelt strongly upon the moral government of the universe—and we must remember that this includes the rich as well as the poor, the comfortable as well as the miserable, the respectable as well as the outcast. You may be selfish, and have no thought of your poor brother, but you cannot get rid of him by not

thinking of him. Brains hereditarily debased, and hearts full of gall and bitterness; are dangerous to the State. You live in a country which especially needs all the heart and brains of educated people in dealing with its social difficulties. You live in a city which, of all cities, bears the heaviest burden of civic responsibility. In Glasgow settle the lees of an enormous wage-earning population. Every facility for communication, the spread of intelligence in health matters, which moves first the best of the working-classes outward, everything tends to leave us with a central mass of people who cannot be trusted to live without supervision and guidance. I hope what you have heard to-night will enable you to take a more intelligent and active interest in the details of our Local Government.—*Sanitary Journal.*

EDUCATION IN THE UNITED STATES.

ABSTRACT OF THE REPORT OF THE COMMISSIONER OF EDUCATION FOR 1884–85.

THE Fifteenth Annual Report of the Commissioner of Education, recently issued, presents a detailed view of education in the United States for the year ending June 30th, 1885, with a brief summary of education in foreign countries. Peculiar interest attaches to the report from the fact that it is the last of the series prepared by General Eaton, who resigned the commissionership, November 5th, 1885, but consented to perform the duties of the office until his successor qualified, August 6th, 1886. In reviewing his long term of service, General Eaton says, what will be conceded by all who are familiar with his work :

" In all the work of this office, it has been my endeavor to regard with the utmost care the spirit and letter of the law providing for its operations. The appropriations for the office have never been sufficient to enable it to do all the work legitimately required of it within the law."

For the year covered by this report, the items of the appropriation as summed up, and paid out, amount to $49,397.60.

" The law establishing the office provides for the annual reports, and the appropriation acts from year to year provide

for special reports, circulars of information, or bulletins. The number of reports, circulars, and other documents distributed during the year was 348,864."

The commissioner reviews the policy of the Government from its foundation with respect to the promotion of general intelligence and the advancement of science, and states that

"This bureau has been greatly cramped in the past by reason of inadequate appropriations, and but for the voluntary co-operation of teachers and school officers throughout the country, a judicious system of international exchanges, and the strictest economy in the use of funds, could not have developed to its present acknowledged importance. Extravagance in the use of public funds can be deprecated by no one more than myself, but I think no reasonable person can doubt but that the work which the office is required to perform demands more liberal appropriations, and that the service which it renders in fostering the educational interests of the country justifies a larger expenditure for its support."

From the statistics of State systems of public instruction, it appears that the school population is, for 38 States, 16,863,265; for 10 Territories, 306,126, or a total of 17,169,391; enrolment in public schools, in 38 States, 10,974,463; in 10 Territories, 195,460, or a total enrolment of 11,169,923; daily average attendance in 35 States, 6,410,557; in 9 Territories, 109,743, or a total daily average attendance of 6,520,300. The enrolment in private schools reported (for 25 States, 659,694; for 2 Territories, 2227) increases school enrolment to 11,831,844. For the entire country eighteen different school ages are reported, the longest being from 4 years of age to 21, the shortest from 8 to 16.

The number of public school teachers reported, all States and Territories except Idaho included, is 319,549. Several States make no distinction of sex in reporting teachers. So far as the distinction is indicated, the excess of female above male teachers is 84,018.

Arkansas, Georgia, Texas, and Indian Territory make no report of teachers' salaries. Twelve States and 3 Territories make no distinction of sex in reporting the item; for these the salaries range from $23.30 to $87.84 a month. For the remaining States salaries for men range from $20.36 to $140.50; for women, from $21.28 to $96.01 a month. The total annual

salary depends, of course, upon the average duration of the school year, which ranges from 62 days in North Carolina to 198 in Maryland.

The total annual income for public school purposes, all the States and Territories, save Kentucky, reporting, was $113,521,895, and the total expenditure, Montana alone failing to report, was $110,384,657. The total value of school property (Georgia, Mississippi, Texas, Vermont, and Indian Territory not reporting), was $255,396,746. Permanent school funds reported for 31 States and 1 Territory amount to $139,911,496.

In all discussions of school attendance in our country, it is important to keep in mind certain particulars to which the commissioner calls attention. Among these we note the length of the legal school period, which includes a much larger proportion of the minor population than may fairly be regarded as the proper subjects of elementary instruction; also the sparseness of the population in the majority of the States, and the difficulty of securing the data necessary for an exact estimation of the attendance. The amount of school attendance is undoubtedly increasing, but improvement in respect to regularity of attendance is not so decided as could be wished. One of the chief hindrances to the progress of our common schools is the multiplicity of school districts and of independent local authorities, with the "inevitable result of small schools, low standards, low wages for teachers, poor supervision or none at all, and waste of funds." Wherever these "petty school sovereignties" have been abandoned, the schools are flourishing; where they are maintained, the reverse is true.

Among hopeful indications for the future of the common schools are the efforts for the improvement of the teaching force, and for bringing the rural schools under efficient supervision, and the increase of the local school tax in sections of the country which have hitherto been negligent of that provision.

The Legislatures of the several States have given a fair degree of attention to school interests during the year. There is a noticeable disposition to extend the powers of State boards and State superintendents of education. According to a recent decision, the judicial powers of the department of

public instruction in New York State extend to the control of the tax lists.

From a brief summary by States of the educational condition of the Union, the following particulars are derived :

THE NEW ENGLAND STATES.

Maine shows for the first time in several years an increase in the number of school children. The number of graded schools and of high schools has increased, and the work of the latter has been more closely adjusted to that of the lower grades.

Following the example set by Massachusetts in 1882, the Legislature of New Hampshire this year passed a law abolishing the division of towns into school districts, and making each town, except some under special acts, a single district for school purposes. Vermont seems to be moving forward to the same end. The expenditure for school purposes in this State was $21,022 greater than in 1884.

Massachusetts shows a slight falling off in school enrolment, but improvement in respect to average attendance, the ratio of the same to membership having reached 90 per cent. High schools had an increased attendance, and numerous fine buildings were erected for their accommodation.

Rhode Island and Connecticut both report increase in school enrolment and average attendance. In the former State the expenditure for public schools was $100,000 more than in 1884, and in the latter, $75,000 more.

Increase in the number of trained or experienced teachers is a noticeable feature of the year's record throughout the New England States.

MIDDLE ATLANTIC STATES.

The enrolment in the public schools of New York was 24,788 greater than that reported in 1883–84, while the average attendance increased by 14,859. The total public school expenditure in this State for the year amounted to nearly $14,000,000.

New Jersey shows improvement in all the essentials of a school system. In Pennsylvania small school districts still hold their place in the school system, to the great detriment of the work of instruction. There was a falling off in the

number of trained or experienced teachers, which is a serious loss; on the other hand, the increase of $254,767 in the expenditure for the schools is a favorable indication.

No statistics for Delaware were available in time for this report. Maryland shows increase in school enrolment and attendance, in the number of schools for the colored race, and in the length of the school term. The average monthly pay of teachers increased by $1.33, the total increase in the amount paid for salaries being $32,000. An equally favorable showing is made for Virginia, enrolment, average attendance, and the number of new school-houses, all indicating an active interest in the cause of popular education. In this State also there was an advance in teachers' salaries, men receiving an increase of 68 cents, and women of 49 cents a month.

SOUTH ATLANTIC STATES.

North Carolina reports for 1885 an increase of 14,723 in the school population, of 13,850 in the enrolment, and of 12,583 in average attendance. The school accommodation was enlarged by the addition of 214 school-houses, the school term extended 4 days, and the value of school property advanced from $483,092 to $565,960. This showing would be even more favorable were the statistics of the graded schools of several towns and cities not omitted.

Owing apparently to insufficiency of school funds, the school system of South Carolina has been seriously embarrassed during the year. There was a falling off in enrolment, in the length of the school term, and in the number of public schools.

No statistics of the Georgia school system, except as regards the chief cities, were available for 1885. Florida gives evidence of unusual activity in respect to popular education, one of the most satisfactory outcomes being an increase of $163,806 in the expenditure for public schools.

GULF STATES.

The reports from Alabama and Mississippi indicate very decided progress in the public schools. With a reported school population only 649 more than in 1884, Alabama shows an increase of 18,331 in the number of pupils enrolled in the schools, of 10,162 in average attendance, of 8 school districts, of 173 schools, and of 210 in the number of teachers employed.

The average annual pay of teachers was slightly raised, and the expenditure for schools amounted to $16,223 more than in 1883–84.

In Mississippi school enrolment increased by 12,024, and average attendance by 29,958. Four hundred and five additional teachers were employed, and the expenditure for schools increased by $68,444.

Reports from Louisiana show a favorable turn in school affairs. The enrolment in public schools was 18,917 greater than in 1883–84, and the average attendance 12,997 greater. The Normal School at Natchitoches, provided for in 1884, was organized in October of the present year, and another at New Orleans promises to give a great impulse to the public schools of that city. The inspiring influence of Tulane University is felt throughout the State.

The reports from Texas are somewhat fragmentary, but indicate a decline in public-school interests.

SOUTHERN CENTRAL STATES.

No detailed report of the educational condition for the current year has been received from Arkansas or from Kentucky. In 1884 important amendments were made to the school law of the latter State, among which are noted provision for the election of county superintendents, for the levy of county taxes, and for an increase of the distributable State school fund from $150,000 to $200,000 a year. Indigent and orphan children are to be supplied with text-books free of cost.

With an increase of 32,000 in the number of school youth enrolled, Kansas reports a decrease of 13,000 in average attendance. The average pay of women teachers was less by $2.57 a month. Public-school expenditure, however, was greater by $505,689 than in the previous year, and the value of school property by $832,163.

The school statistics of Missouri show increase in the following particulars: In enrolment in the public schools, bringing the number up to 67 per cent of the youth of school age; in the number of schools; in the number of teachers; in the number of teachers permanently retained in one place; and in the average salaries paid. On the other hand, there was decrease in the average attendance upon the schools, in the

length of the school term, and in the expenditure upon public schools.

Tennessee and West Virginia show improvement in all the essentials of an efficient school system. In Tennessee about 61 per cent of the school population were enrolled in the public schools, which is a very fair proportion, when the extent of the legal school age (6–21) is considered. The enrolment in private schools, 25,569, raises the total enrolment reported for all schools to 399,446, out of a school population of 609,028. In West Virginia the enrolment in public schools was 75 per cent, and the average daily attendance 44.46 per cent of the school population. The only exception to the favorable indications in this State is a decrease of $5 in the average monthly pay of teachers.

NORTHERN CENTRAL STATES.

No detailed statement of the educational condition of Indiana and Minnesota for 1885 will be available until the publication of their next biennial reports. The partial returns received, however, indicate that these States share in the progress which is so marked a characteristic of the section to which they belong.

Ohio, with a school population (6–21) numbering 1,095,000, enrolled 774,660, or nearly 71 per cent, in the public schools. The number of teachers continued in the same schools was 841 more than in the previous year; and while the average monthly pay of men was decreased by $1 a month, that of women, who form a majority of the teachers, was increased by $2. Although the average term for the State was 27 days less than in 1883–84, 35 fewer districts were reported in which it was less than the 24 weeks required by law.

Illinois, with a school population (6–21) of 1,077,000, enrolled 738,887, or about 68 per cent. The number of graded schools and the salaries of teachers were increased. As compared with the previous year, school expenditure was $570,742 greater, the value of school property $1,301,580 greater, and the State school fund was augmented by $12,566.

In Michigan 69 per cent of the school population (5–20) were enrolled in public, and 5 per cent in the private schools, making a total enrolment of 74 per cent. The number of

graded schools increased, and more teachers' institutes were held. Unfortunately, the pay of teachers was slightly decreased, as was also the length of the average school term.

The enrolment in the public schools of Wisconsin was only 59 per cent of the school population, which low rate is perhaps accounted for by the early age at which the legal school period begins—viz., 4 years. The statistics seem to indicate frequent change of teachers, in which respect, however, improvement may be looked for in the increased wages paid to county teachers. Public-school expenditure amounted to $335,595 more than in 1883–84, and the value of school property to $201,845 more.

The reports from Iowa show gains in respect to enrolment, number of schools, and teachers, and the amount of school property and of the school fund. On the other hand, there was a falling off in average attendance, and in the expenditure for public schools.

The statistics for Nebraska and Colorado, as compared with the same for 1883–84, show progress in nearly every particular. In Nebraska about 69 per cent, and in Colorado about 67 per cent of the school population were enrolled in the public schools. In the former State the average monthly pay of teachers advanced $2, and all public-school expenditures $1,075,527, the entire sum so expended being $2,918,157. In Colorado also the expenditure increased, though not so much as the value of school property and the permanent school fund. The valuation of school property in Nebraska was over $641,000 more, and the amount of the permanent school fund $348,421 more than in the previous year.

STATES OF THE PACIFIC SLOPE.

The school interests of Nevada are suffering from business depression in the mining districts, for which, among other reasons, Superintendent Young has deferred a detailed report until next year. Detailed statements of the educational condition of California and Oregon will also be deferred until the next biennial reports are made in those States. Meanwhile, from statistics supplied by the State superintendents, it appears that there is general progress in the school affairs of both States.

THE TERRITORIES.

Dakota seems to take the lead among the Territories in respect to the vigor and efficiency of its school system. The expenditure for public schools in 1884–85 amounted to $507,333, and the valuation of school property to $498,193. Progress in nearly all particulars is shown in Arizona, Idaho, and Montana. An increase of $24,504 in expenditure for public schools, and a still larger increase in the estimated value of school property, are the only favorable indications reported from Utah respecting the public schools. Many mission schools were maintained by the various religious denominations. Fair progress is evidenced in the reports from Washington and Wyoming.

The partial reports from Indian Territory show increase in the number of schools and of pupils. To the work in this Territory, the general Government contributed $992,800. Very meagre reports have been received from the District of Columbia, though the school system there is in a flourishing condition.

Dr. Sheldon Jackson, recently appointed United States general agent for educational affairs in Alaska, reports the schools in 1884–85 in a prosperous condition under missionary supervision.

On March 2d, 1885, the Secretary of the Interior assigned to the United States Commissioner of Education the duty of providing for educational work in Alaska. This looks toward an enlargement of school training there, which will require additional teachers, buildings, furniture, charts, books, etc., and must require an increased appropriation. As nearly as can be ascertained from the United States Census of 1880 there are 11,237 children of school age to be provided for within the Territory.

EDUCATION IN THE SOUTH.

Under the head of "Comparative Statistics of Education in the South," the commissioner calls particular attention to the educational condition and wants of this section. The entire school population of the former slave States is 6,359,252, of whom 4,315,556 are white, and 2,043,696 colored. The enrolment in public schools is 3,707,374—viz., 2,676,911 white

and 1,030,463 colored. The total public-school expenditure for both races amounted to $17,227,373. The expenditure for schools has increased in all the States from which the item is reported for the year.

Of even more importance is the fact that in eight of the sixteen States considered the local school tax has increased, the total increase being $705,148.

In the cities and larger villages graded schools are rapidly replacing the ungraded, school-houses are multiplying, and the work of normal schools is increasing. It would, however, be wrong to infer that the improvement affects all localities, or that it has placed the Southern States on an equality with the Northern States as regards provision for the instruction and enlightenment of the entire population.

Complaint is still heard of opposition to the school tax in many localities, and even where the tax is promptly collected, the funds are not equal to the necessities of the case.

According to Hon. S. M. Finger, State Superintendent of North Carolina, 1500 districts of that State are destitute of school-houses. One county commissioner of South Carolina reports the closing of schools during the year to save money for building, and the same thing has been done elsewhere.

Hon. R. R. Fair, Superintendent of Education for Virginia, states that 1095 schools are still needed to give to all the children of his State equal school facilities.

In many districts the school fund is not sufficient to maintain schools for more than two months. Under these circumstances the white people often manage to prolong their schools by voluntary contributions. The colored people are unable to do this, and unless missionary societies or some other charitable organizations come to their help their children are turned adrift for nine or ten months, to forget amid ignorant parents and companions, the little they have managed to learn in the brief school term. It is obvious that the short duration of the school year in the South greatly increases the disadvantages under which education is pursued in that section. The average length of the public-school year in Alabama, Florida, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia is 98.5 days; in 25 Northern and Western States which report the item the average length is 145.9; in other words,

the children in the former States for whom accommodation is provided have only two thirds as much schooling per annum as those in the latter States. The South also suffers particularly from the want of qualified teachers in the elementary schools.

While both races are affected by these drawbacks, it is the colored people whose welfare is most seriously threatened. "In my judgment," says the commissioner, "there is no graver problem before us than the adequate and appropriate training of these people, who, after years of servitude, were suddenly invested with the rights and duties of citizenship. They require a training specially adapted to their wants, a training in which the moral and industrial aptitudes shall receive equal attention with the intellectual. These conditions are well understood; the methods, the subjects of instruction, the material appliances required for the development of the colored population of the South have been fully considered, and I am satisfied that if the means were forthcoming the work would go rapidly forward to satisfactory results."

The commissioner also urges all persons and organizations, State, local, or corporate, having colored instruction in charge, to promote industrial training by every means, both as a substitute for the trade-apprenticeship when it is denied them, and as the most effective means of preparing the working people of the South for the new and remunerative occupations, which must inevitably diversify and round out the social requirements and industrial development of the future of that region.

The summary of all public schools, normal schools, secondary schools, colleges, etc., for the instruction of the colored race, gives a total of 19,222 schools and 1,053,963 pupils. As compared with 1883-84 this is an increase of 1455 schools and 27,844 pupils, and as compared with 1877, the first year for which the summary was given, it is an increase of 8343 institutions and 473,946 pupils. This seems the more remarkable when it is considered that the greater part of the work of secondary, superior, and professional education here represented is the result of denominational or of private zeal and benevolence.

THE PEABODY AND JOHN F. SLATER FUNDS.

The policy of concentrating the appropriations from the Peabody Fund upon the training of teachers has been main-

tained, and the general agent, Dr. J. L. M. Curry, by correspondence and public addresses, as well as by the directive and stimulating use of the income, has sought to secure the establishment of normal schools in all the States. The detailed report of the distribution of the income for the year ending October 1st, 1884, shows that out of a total of $57,705, the amount expended for normal schools, teachers' institutes, and Nashville scholarships was $52,305, the balance, $5400, having been expended upon public schools.

The disbursements from the John F. Slater Fund in 1885 amounted to $36,764, or nearly double the total for 1884.

In accordance with a resolution passed October 3d, 1884, Dr. A. G. Haygood, the general agent of the fund, has devoted his entire time to the work since January 1st, 1885.

The policy adopted by the trustees of giving special attention to the fostering of manual training for the freedmen has been steadily maintained.

At a meeting of the trustees held May 20th, 1885, it was reported that, in pursuance of a resolution passed at the previous meeting, several members of the committee had given much attention to the subject of manual training, and had visited schools engaged in such work, and that much data on the subject had been collected by the chairman of the committee with reference to publication. At this meeting it was resolved, "that the appropriations for the next school year to be allotted by the general agent shall be $30,000, including a special appropriation, not exceeding $1000, to meet a request from General Armstrong for a special purpose mentioned in his letter to this board;" and "that an additional sum of $5000 may be expended in the general work of the trustees, if, as the year advances, the finance committee think that such a course will be wise."

The following totals are derived from the statistics of 276 cities, representing more than one fifth the total population of the United States, and an expenditure for school purposes of about one third of the total expenditure.

School enrolment (one city not reporting), 1,941,166; total receipts for public schools (7 cities not reporting), $36,082,543; total expenditure (6 cities not reporting), $33,084,874. For 235 cities reporting legal school population, total enrol-

ment, and average attendance, the figures for the same are 3,101,996, 1,693,747, and 1,186,715 respectively. This gives an enrolment equal to 54 per cent of the school population, and an average attendance equal to 70 per cent of the enrolment. If the estimated attendance upon private schools be added, it brings the school enrolment to 67 per cent of the population.

Examination of the latest returns from 40 cities having each a population above 25,000 shows that the per cent of average attendance estimated upon average enrolment fell below 85 in but one city, in which it was 74 per cent; for the remaining 39 cities it ranged from 85 to 99 per cent. This indicates the extent to which these schools maintained the interest of their pupils, and the co-operation of their patrons, a matter quite apart from that of securing the attendance of the entire school population.

To sum up the evidence regarding regularity of school attendance and the amount of school attendance, it appears that in respect to the former the record of our city schools is creditable, but in respect to the latter it is far from satisfactory. It is the opinion of the most competent authorities on the subject that an obligatory law is necessary to secure the attendance of all children at schools. The absence of such a law, or its inefficient execution, is regarded as the chief cause of insufficient school attendance. A second and scarcely less potent cause of the evil is inadequate school accommodation, a matter toward which public attention is gradually turning.

Detailed reports of the truant service of New York City and Boston show the possibility of so managing the work as to ascertain the exact causes of non-attendance and of irregular attendance. The salaries of superintendents are reported from 230 cities. In 60 of these the amounts range from $2000 to $3000; in 18, from $3000 to $4000.

Under the heads of "Supervision," "Free Text-books," "Gymnastics," "Tenure of Office of Teachers," and "Administration," the report presents copious extracts from a circular prepared by the lamented Dr. Philbrick, who is universally recognized as an authority on all matters relating to city school systems.

(*To be continued.*)

INCREASING CONSUMPTION OF CINCHONA BARK ALKALOIDS.

I HAVE been a cinchona planter for the last twenty years, for the last six years of which period I have lived in England and sold my bark, so that I have had some experience of the London market. I, for one, should be only too glad not to sell either in Europe or in the East (for if sold in the East it would ultimately reach Europe) any bark analyzing less than one and one half per cent.

This is a vital question with all cinchona planters, and is one which can be solved if they will work together.

I have my opinions with regard to a solution, and intend to give them ; meantime, I hope Ceylon planters may be induced to take up the subject in earnest. They constitute the great majority of cinchona planters, and it is chiefly their bark which is swamping the market.

May I suggest the following facts for consideration ? The enormous scope for increased consumption of cinchona bark alkaloids

IN CHINA.—The population of China proper alone is 360,000,000, a great part of the country being more or less feverish. Colquhoun, in " Across Chrysê," writes : " Quinine is the best present any traveller in Yunnan can carry." " For gifts quinine, etc., may be recommended." " A crowd of people came beseeching us for medicines. We could only give them a few small doses of quinine." " The magistrate had sent to ask us for some medicine for destroying the passion for the black smoke—viz., opium."

The value of the opium consumed in China is fourteen or fifteen million pounds sterling. This shows that the Chinese are willing to pay for what they want. Might not the introduction of the cinchona alkaloid be made to supersede some of this opium ?

BURMA is another large country, a large portion of which is feverish.

SOUTHERN INDIA.—Dr. Cornish, an officer who has lately held high appointments in South India, says the use of the cinchona alkaloids may be largely extended.

IN TROPICAL AFRICA AND SOUTHERN EUROPE fevers are prevalent. The existing generation of planters is hardly likely to see the consumption of the cinchona alkaloids much increased if it waits for the course of supply and demand in the countries (mostly uncivilized) I have named.

THE PRICE OF QUINETUM in London now is *1s. 9d.* per ounce, of sulphate of quinine, *2s. 10d.* per ounce.

THE EXPENSES OF MAKING QUINETUM in Ceylon from low quality bark would probably be not more than *4d.* per ounce, including cost of bark at market value.—*Tropical Agriculturist*, September, 1887.

W. T. HODY COX.

ILLITERACY.—President John Eaton, of Marietta College, Ohio (late Commissioner of Education), read a paper recently on Illiteracy, in which he said that the perils of illiteracy to our civil affairs are seen in the fact that of over 12,000,000 voters over 7 per cent of the whites and over 68 per cent of colored are illiterate. We have 6,239,958 illiterates 10 years old and over. They would outnumber the present population of New York and New Jersey. Put in families, averaging four persons each, they would make 1,559,984 totally illiterate families. The remedies of illiteracy must be, first, the united action of all voluntary agencies for man's improvement; second, that of the Church in all its forms; third, we must teach letters by the State.

THE OCCUPATION OF A YOUTHFUL SANITARIAN.

DEAR — PAPA —

WRITE — TO — ME — SOON — WE — COMBED — THE— CATS — THREE—OR—FOUR—TIMES—TO—DAY—GOT— LOTS — OF — FLEAS—

GOOD — BY—

CARL—B———

EDITOR'S TABLE.

THE NEW YORK QUARANTINE AS VIEWED BY ITS OFFICIALS.

APROPOS to the report of the Committee of the Academy of Medicine on the Present Condition of the New York Quarantine Establishment, on other pages of this number, we now have before us the Report of the Commissioners of Quarantine and the Health Officer's report appended. With regard to the committee's report, considering our recently expressed views of the same subject (in November number), we have nothing to add—the description is complete. And the report of the officials recognizes and declares no less pointedly than other competent observers the disgraceful condition of the establishment. The Commissioners disclaim all responsibility for it, and say that they have "from year to year urged upon the Legislature the placing of the quarantine property in such repair as would, at least, permit it to be used in some measure effectively to prevent the introduction of disease. In every case the Legislature has promptly and favorably responded, but in almost every case Governor Hill and his predecessor, Governor Cleveland, have disapproved, and so the most of this property, which has cost the State about two millions of dollars, has wholly, because of this want of funds, fallen into general decay, and, in the case of Hoffman Island particularly, is scarcely tenantable for the purposes it was provided for." To this it may be said with equal justice and without disrespect of either party, that political ascendency has been regarded by both political parties as of more importance than the safety of the public health, or there would have been, at least, some compromise by which the establishment would have been in a condition better calculated to contend with cholera, which has maintained a menacing attitude for several years, to say nothing of the importance of the scarcely less needful facilities all the time for preventing small-pox, yellow-fever, and other infectious diseases.

The Health Officer reports in detail the difficulties with which he has had to contend under the imperfect conditions of the establishment—his fruitless efforts for their improvement, the makeshifts to which he has been obliged to resort, and, most important of all, the success which has crowned his efforts in the prevention of cholera, notwithstanding the imperfections of the establishment and the misrepresentations of officious visitors and other persons, with regard to whom he remarks :

"In view of the systematic effort to impair public confidence in the quarantine officials at this port by whatever misrepresentations and falsehoods would seem best calculated to serve their purpose, it is proper that I should remind your Honorable Board (the Commissioners) that I have for nearly eight years last past been the health officer of the port of New York, whose principal office and duty it is to prevent the introduction of contagious and infectious diseases that approach from the sea ; that during that period immigration from the Old World has poured through this port into the country far surpassing any ever before known in our history ; that epidemics of the most fatal diseases that afflict mankind have prevailed during my administration in the countries from whence many of those immigrants have come, and to which more than a hundred thousand people have fallen victims ; yet there has been no lodgment of these epidemic diseases in the dense populations of the cities that environ this port, nor among the millions of people in interior communities ; and the tide of commerce between the stricken countries and our own has flowed on with scarcely perceptible interruption or restriction. The ship-owners and merchants have been relieved of an annual expense of $75,000 in the lightering of cargoes, and the business of the commercial community by this means greatly expedited. With this record I am content to bear the misrepresentations which for a year or two last past have characterized the attacks upon the quarantine department."

He concludes with a recommendation of such repairs and additions as his long service shows to be eminently necessary and practical for the perfection of the establishment.

"Disinfection by steam heat," he remarks, "is more efficient than any other method, whether the agent is employed in disinfecting clothing or baggage, or the hospital rooms and

the holds of infected vessels; the practical difficulty has been to secure enough steam heat at a sufficiently high temperature." To this end he recommends that a steam boiler with sufficient power be provided upon a steamboat which could also be used for other purposes. But the example given, of steaming the Britannia's steerages by means of her own engine, by which a temperature of 200° F. was maintained for several consecutive hours "in the parts most remote from the point at which it was introduced," followed by the complete arrest of the cholera, demonstrates the practicability of applying a sufficiently high temperature for disinfection even under very ordinary circumstances.

Owing to the continuous complaints of persons who live in the vicinity of the quarantine burying-ground on Staten Island, he recommends the erection of a crematory on Swinburne Island for the cremation of those who die there of infectious diseases.

Taken altogether, and considering all the circumstances, the Health Officer's report is eminently creditable to his service, notwithstanding the embarrassments which have beset him.

YELLOW-FEVER.—Fortunately for the people of Tampa and other places in communication therewith, the setting in of cold weather has estopped the yellow-fever there for the time being, notwithstanding the auspicious circumstances under which it was introduced and has been maintained—conditions not only eminently propitious to its continuance as long as temperature favored, but such as, if persisted in, will, in all probability, on the return of warm weather, fully illustrate the facility with which yellow-fever may be transplanted under such favoring circumstances anywhere.

Preparatory to such arrangements as would promote commercial enterprise wholly regardless of the public health, it appears that in January last the Plant Steamship Company took special pains to propitiate the favor of such local "sanitarians" thereabouts, and some other persons of influence, as would approve of its plan for free, easy, and frequent communication between Havana and Tampa, under the privileges of a "board of health," apparently organized with special reference to unrestricted communication with Havana, whose

president and executive officer was an avowed disbeliever in quarantine under any circumstances, and who, as we are credibly informed, was so careless of the public health as to frequently permit communication with the Plant Steamship Company's ships less than twenty-four hours from Havana before he inspected them ; and, indeed, in some cases is said to have wholly omitted visitation to ascertain whether there were any cases of fever on board, or any conditions likely to propagate infection.

It is public knowledge that in June last, before the outbreak of the fever in Tampa, Dr. Joseph Holt, President of the State Board of Health of Louisiana, with that keen sense of danger from yellow-fever under such auspices, which is habitual to him, wrote to the Governor of Florida, urging his attention to the danger of introducing yellow-fever not only into Florida, but contiguous States, unless protective measures were speedily adopted. But no efficient measures were instituted, and the so-called "Board of Health" of Tampa for the promotion of yellow-fever, has not only persisted in its course, but appears to have been sustained by the United States Marine Hospital Service in the use of the appropriation "for the prevention of epidemic diseases," while nearly four hundred cases of, and over seventy deaths from, yellow-fever have occurred, without any effort whatever, so far as we have been able to learn, to exclude it or stamp it out. The simple designation of a refuge station at Egmont Key, long after the fever was well under way at Key West (where, by the way, it seems to have gained a permanent foothold, notwithstanding the "national quarantine" supported by the National Treasury), with such an insignificant result as to have secured the removal of less than fifty well persons thereto for safety ; and meanwhile keeping up unrestricted communication bi-weekly between Havana and Tampa, is, to say the least, a very remarkable illustration of the methods of the Marine Hospital Service in its attempts to prevent the introduction and spread of epidemic diseases.

The only excuse we can conceive of, consistent with knowledge, of this second example of the United States Marine Hospital Service's methods of dealing with epidemic diseases (the first being that at Brownsville, Tex., six years ago), is

under that quibble of the law which leaves the direction of affairs to the local authorities and limits national aid to the mere supply of the funds to carry out purposes wholly inconsistent with practical knowledge necessary for the prevention of epidemic diseases.

SMALL-POX seems to have again made a fresh start in Brooklyn since the setting in of cold weather, and so generally scattered in its outbreaks as to render the efforts of the Health Department to trace it well-nigh impracticable, especially so since, despite the vigilance of the inspectors, cases are frequently secreted and cared for by their friends without medical attendance until they are alarmed by the gravity of the symptoms. During the month of December there were of cases reported 21—19 sent to hospital, with 4 deaths, 2 in the city and 2 in the hospital. Since January 1st to the date of this writing (January 23d) there have been reported 54 cases—46 sent to hospital, 7 quarantined in the city, and 1 death without medical attendance.

The Health Department is employing a large vaccinating corps, and is sanguine of speedily stamping out the disease; but an increase of more than double the number of cases in three weeks is, to say the least, not very encouraging.

San Francisco also reports a considerable increase—33 cases, with 4 deaths in November, to 10 during the month of December, the number of cases not mentioned in the report of the Secretary of the State Board for the month of December. The Secretary remarks, however, that

"Small-pox is slowly but surely disseminating itself throughout the State. It has been declared epidemic in San Francisco; is present in a sporadic form in Alameda, Solano, Marin, Sonoma, San Joaquin, Butte, Contra Costa, Nevada, Siskiyou, Lake, and Sierra counties. This scattering of so contagious a disease as small-pox over so large a section of the State indicates its source as being from a common centre where disease germs are in abundance, and are thence conveyed by visitors in their systems or in their clothing, to be developed as they reach their several homes. All the cases, so far as known, trace their origin to San Francisco. In Sierra City the disease assumed epidemic proportions, there being no less than nineteen cases in that town. We may expect a like result in other towns as the disease progresses.

The history of small-pox in this and other States is about the same. For a number of years the disease is absent. Then negligence takes the place of vigilance, and vaccination is deferred, until the number thus unprotected has assumed such large proportions that small-pox, if introduced, is supplied with an overabundance of material susceptible to contagion, so that the disease in a short time assumes an epidemic form, until all the available sources of supply are exhausted, and every unprotected person attacked. We are just now emerging from this period of quiescence throughout the State, the material for infection is abundant, and small-pox is abroad. Therefore, without general vaccination throughout California, we cannot possibly escape the result of our negligence. The small-pox of to-day is the same small-pox described by Procopius nearly fourteen hundred years ago, that slaughtered and laid waste the Eastern world; and if material is furnished as then, its ravages are no less sure. The State Board of Health again reiterates its advice to vaccinate all unprotected persons, and to revaccinate those, the protective power of whose vaccination may have become impaired through lapse of time. Do not wait until small-pox invades the community in which you live before availing yourself of the only preventive means that exists to avoid the disease. It may then be too late, and yourself be the first victim to the malady. Above all, pay no attention to the inevitable fool that is sure to arise to air his ignorance by declaring that there is no safety in vaccination, and that it is a delusion. The history of small-pox emphatically gives such cranks positive contradiction. There *is* safety in vaccination; without it there is none."

These remarks are no less applicable to other places than to San Francisco, and should stimulate legislative action everywhere to such measures as will make vaccination compulsory and its neglect a crime.

Abroad during the periods of time stated since our report in December number, the number of deaths reported from small-pox are as follows:

Sheffield: During the week ending December 24th, 21.
Edinburgh: During the week ending December 31st, 1.
Bristol: During the week ending December 31st, 2.
Paris: During the two weeks ending December 31st, 9.
Lyons: During the week ending December 24th, 1.
Nice: During the two weeks ending December 15th, 6.
Jumet: During the week ending December 24th, 3.
Péruwelz: During the two weeks ending December 31st, 3.

Nivelles : During the week ending December 31st, 2.
Dinant : During the week ending December 31st, 1.
Vienna : During the two weeks ending December 24th, 2.
Pesth : During the two weeks ending December 24th, 6.
Prague : During the two weeks ending December 24th, 26.
Trieste : During the four weeks ending December 31st, 34.
Presburg : During the two weeks ending December 17th, 3.
St. Petersburg : During the two weeks ending December 24th, 2.
Warsaw : During the two weeks ending December 24th, 20.
Rome : During the week ending December 3d, 4.
Milan : During the month of October, 54.
Genoa : During the month of November, 64.
Florence : During the month of October, 59.
Venice : 18th to 24th of December, 1.
Buenos Ayres : During the month of October, 89.
Bombay : During the week ending November 22d, 1.

From Surgeon-General Hamilton's Abstract :

Cienfuegos : During the three weeks ending January 2d, 65.
Guayaquil : During the two weeks ending December 11th, 23.
Martinique : During the week ending December 17th, 20.
Havana : During the month of December, 312.

CHOLERA, from Surgeon-General Hamilton's "Abstract of Sanitary Reports received through the Department of State from Foreign Countries" during the three weeks ending January 20th, 1888, as follows :

"Callao : The United States Consul, in his despatch dated November 28th, 1887, states that 'on the 26th instant a cable message was received by the Government at Lima from the Peruvian Consul at Valparaiso, announcing that several cases of cholera had appeared at that port. A decree was then issued by the President ordering that all Peruvian ports be closed to vessels proceeding from those of Chili, with the exception of such shipping touching only at Punta Arenas (Sandy Point) in the Straits of Magellan ; and this ordinance is to be held in force until the construction of the lazaretto on the island of San Lorenzo, in this bay, be concluded, and it is possible to establish a strict quarantine in accordance with proper sanitary observances. The work on the lazaretto is

being actively pushed under the supervision of the Board of Health.' . . . December 9th. 'The latest report received by the Government here from Dr. Matto, sent officially to Chili to observe the progress made by the cholera, is to the following effect: "Santiago, December 7th, 1887. I have visited the lazarettos and sanitary establishments at Santiago. The epidemic is stationary. Sixty new cases; one third die. Treatment has happiest effect. At Valparaiso, 10 cases. An increase at Rancagua. At Concepcion, none." The sanitary regulations established here, and stated in my recent despatches, are rigorously observed. The lazaretto on San Lorenzo Island is approaching completion. Health of city and coast satisfactory.'"

Calcutta: During the three weeks ending December 3d, the number of deaths from cholera was 37.

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

CALIFORNIA.—The Secretary reports from 90 towns, in which deaths occurred during the month of November, a mortality of 1169 in an estimated population of 754,950, which gives a percentage of 1.54 per 1000 for the month, and an annual rate of 22.06. The increased mortality is attributed to the greater prevalence of pneumonia, diphtheria, and typhoid-fever, the numbers of deaths from which diseases were: Pneumonia, 112; diphtheria (and croup), 78; typhoid-fever, 56. "Typhoid-fever is found in nearly every town in the State. This must be expected from the continued absence of rain during the month. Typhoid being now generally recognized as due to a specific infection which finds its nidus in conditions brought about by a failure to deal properly with the solid and liquid refuse of population, it is not surprising that we should find the disease prevailing in all those towns where sewerage is deficient or entirely absent. . . . Diphtheria continues to spread over the State. It prevails in San Francisco, over 80 cases being reported last month; in Sacramento, Anaheim, Etna Mills, Martinez, Millville, Biggs, Colton, San José, Oakland, Anderson, Truckee, Igo, Pomona, Santa Ana, Eureka, Sonora, Watsonville, Williams, St. Helena, Suisun, Pine Creek, Amador City, and Rock Creek.

In Suisun it was very prevalent, and Dr. Downing writes that it appeared also on Grizzly Island, in Sacramento River. In Pine and Rock Creeks, in Tehama County, Dr. Harvey writes, the disease was particularly virulent, there being 8 deaths out of the 21 cases seen. The region attacked is, Dr. Stansbury says, near the foothills in places sparsely settled, and where we would suppose the drainage good. The first cases came directly from the foothills. Croup is noted in those towns where diphtheria prevails, especially in Anaheim, Lemoore, Downey, Millville, Modesto, and Redding." Small-pox, in San Francisco especially, is noticed on a preceding page. Consumption is also credited with a greatly increased number of deaths, 160, as against 48 during the preceding month; and generally, the Secretary remarks: "Reports of sickness received from 100 localities throughout the State decidedly indicate an abnormal amount of sickness; especially in diseases affecting the respiratory and alimentary tracts. There is no doubt that the contamination of the soil by waste matter deposited in the vicinity of dwellings where there is no sewerage is a prolific cause of typhoid-fever. This waste, being chiefly fluid, sinks into the soil, and, with the continued lowering of the water, slowly percolates through the parched earth, until finally it reaches the well water and loads it with tasteless, odorless, and, by sight, undiscoverable poison."

CONNECTICUT.—The Secretary's report of mortality throughout the State, and particularly in the 28 towns of more than 5000 inhabitants, each aggregating 454,400, during the month of November, shows that the health of the State continues to be remarkably good. "The total number of deaths in November was 791, as against 839 in October; but as more towns were heard from in the latter month, the death-rate will afford a juster indication; this was 14.2 in November, against 15.25 in October. This is the lowest death-rate since the returns from all the towns have been received."

Of deaths from zymotic diseases there were from measles, only 2; scarlet-fever, 12; diphtheria and croup—the most fatal—66; whooping-cough, 1; typhoid-fever, 23.

Consumption, as usual, was more fatal than any other one disease—106 deaths were attributed to it.

Meteorological conditions: Monthly mean humidity, 70.4 per cent; monthly mean dew-point, 30.7; number of clear days, 13; number of fair days, 12; number of cloudy days, 5.

DELAWARE.—*Wilmington* reports for the month of November 70 deaths in a population estimated at 57,000, of which 32 were under five years of age, representing an annual death-rate of 14.74 per 1000. From zymotic diseases there were 16 deaths, and from consumption, 5.

ILLINOIS.—*Chicago* reports for the month of November 1075 deaths in a population estimated at 760,000, of which 421 were under five years of age, representing an annual death-rate of 16.97 per 1000. From zymotic diseases there were 274 deaths, and from consumption, 100.

Rock Island reports for five weeks ending November 26th, 21 deaths in a population estimated at 13,655, of which 17 were under five years of age. Death-rate, 19.9 per 1000. From zymotic diseases there were 14 deaths, and from consumption, 1.

IOWA.—The *Bulletin* reports the number of deaths and death-rates of Burlington and Davenport, with populations of 23,459 and 23,830, for the *month* of November, respectively, 27 and 43, 0.80 and 1.8. Of the total number in Davenport, 9 were from diphtheria.

LOUISIANA.—*New Orleans* reports for November 349 deaths in 176,500 white population, and 168 deaths in 66,250 colored population—making the respective death-rates 23.7 and 32.4 per 1000, and 25.55 for the whole population of 242,750. The deaths from zymotic diseases numbered 97, and from consumption, 72. There were 166 deaths under five years of age.

MARYLAND.—*Baltimore* reports for four weeks ending November 26th, 560 deaths in a population estimated at 437,155, of which 198 were under five years of age. Death-rate, 16.65 per 1000. From zymotic diseases there were 107 deaths, and from consumption, 71.

MASSACHUSETTS.—*Boston* reports for the month of November 808 deaths in a population estimated at 400,000, of which 253 were under five years of age, and representing an annual death-rate of 24.2 per 1000. From zymotic diseases there

were 146 deaths, and from consumption, 126. Summary of deaths, with the principal causes, for the year 1887: Total, 10,173; death-rate, 25.18—against 23.17 for preceding year. From zymotic diseases, 1933—1644 in 1886; respective percentages for the two years, 19.7, 17.73. From typhoid-fever: in 1887, 183; in 1886, 135. Diphtheria and croup: in 1887, 410; in 1886, 423. Phthisis pulmonalis: in 1887, 1526; in 1886, 1607. Of children under five years: in 1887, 3652; in 1886, 3186.

MICHIGAN.—The Secretary reports for the month of November, 1887: Compared with the preceding month, the reports indicate that pneumonia and erysipelas increased, and that typho-malarial-fever, remittent-fever, diarrhœa, dysentery, intermittent-fever, and cholera morbus decreased in prevalence.

Compared with the preceding month, the temperature in the month of November, 1887, was considerably lower, the absolute humidity and the day and the night ozone were considerably less, and the relative humidity was slightly more.

Compared with the average for the month of November in the nine years 1879–87, intermittent-fever, typho-malarial-fever, consumption of lungs, remittent-fever, and diphtheria were less prevalent in November, 1887.

For the month of November, 1887, compared with the average for corresponding months, in the nine years 1879–87, the temperature was about the same, the absolute and the relative humidity were slightly less, and the day and the night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of November, 1887, at 63 places, scarlet-fever at 36 places, typhoid-fever at 39 places, and measles at 18 places.

Reports from all sources show diphtheria at 5 places more, scarlet-fever at the same number of places, typhoid-fever at 6 places less, and measles at 6 places more in the month of November, 1887, than in the preceding month.

Detroit.—Health officer reports for the month of November 244 deaths in a population estimated at 200,000, of which 49 were under five years of age, and representing an annual death-rate of 14.78 per 1000. From zymotic diseases there were 53 deaths, and from consumption, 32.

MISSOURI.—*St. Louis*: Commissioner reports for the month of November 776 deaths in a population estimated at 420,000, of which 266 were under five years of age, and representing an annual death-rate of 22.17 per 1000. From zymotic diseases there were 248 deaths, and from consumption, 70.

NEW YORK.—*The Seventh Annual Report of the State Board of Health for* 1886 reports increased attention to the mandates of the law requiring *all* towns to have organized local boards of health and a health officer in co-operation with the State Board, yet such a considerable number of delinquents as to justify the recommendation by the Board "that its organic law be so amended as to authorize its executive officer, where an emergency arises, and the local board of health of the town or village in which the emergency occurs has not organized and appointed a health officer, to appoint a physician as acting health officer, at the expense of the town or village concerned, who shall, until such time as a board of health for said place has been organized, as provided for . . . have and exercise, under the direction of the Secretary of the State Board of Health, all the powers and duties of a board of health regularly appointed."

The statistics of this report are for eleven months of the year, only the December returns not being in at the time of the compilation. The death-rate from zymotic diseases in the aggregate is lower than for the previous year—217.82, as against 222.17 per 1000 of total mortality. "There were 34 deaths from small-pox, all but 2 of which occurred in the large cities of New York and Brooklyn. From typhoid-fever the death-rate is about the same as in 1885" (13.36, as against 13.27 per 1000 from all causes); "from diarrhœal diseases it is a little less; from croup and diphtheria, which have prevailed extensively in many localities, the death-rate has been considerably larger than in 1885. Diphtheria more than any other disease," the *Board* remarks, "is a measure of domiciliary unhealthfulness, and it is in the direction of remedying its causes that much remains to be done throughout this State." Vital statistics, as summed up by the standing committee on the subject, "for the twelve months of the year, are as follows: Births, 37,062; deaths, 33,486; marriages, 17,085. The entire number of certificates received during the

year, 87,633. There have been registered up to the present time (December 31st), 140,000 births, 120,000 deaths, and 63,000 marriages—in all, 323,000 certificates. . . . Doubtless the number of deaths in the entire State for the year is not far from 100,000; when the December returns have been received nearly 90,000 deaths will have been accounted for. . . . Of the 79,108 deaths that are tabulated in the eleven monthly issues of the *Bulletin*, 30,060, or about 38 per cent, were of children under five years of age; . . . 16,840 deaths, or 21.30 per cent, are reported from zymotic diseases."

From consumption the number of deaths recorded for the eleven months was 10,900—137.79 per 1000 of deaths from all causes. "The conjoined death-rate of consumption, zymotic diseases, and puerperal diseases is 361 per 1000, or a little more than one third of the total mortality."

From diphtheria and croup there appears to have been a continued increase in the number of deaths for several years, the rate per 1000 deaths from all causes being, in 1884, 47.65; in 1885, 56.06; and in 1886, 62.36. Accepting the preceding statement that "diphtheria is more than any other disease a measure of domiciliary unhealthfulness, it is in the direction of remedying its causes that much remains to be done throughout the State." This progress of the disease is not complimentary to the progress of practical sanitation under the auspices of the Board. It is greatly to the credit of the Drainage and Sewerage Committee, however, that signal progress has been made in this direction, although dealing with the subject only as reported to the Board without its seeking. A large amount of filth hitherto tolerated by various communities abundantly sustains the statement of the relation of diphtheria thereto, than which there is nothing better calculated to stimulate effort on the part of all decent and intelligent people to get rid of it. Moreover, if these examples of needful sanitation, to which the attention of the communities severally has been aroused, were interpreted as they should be, as an index of approximate conditions—promotive of diphtheria and other filth diseases throughout the State—and dealt with as they should be, without waiting for the fatal results of such conditions, which appears to be the practice, the effective work of the State Board would be more efficient in lessening

the number of deaths from preventable disease and more emphatically demonstrate the wisdom of its creation.

The reports of the "Standing Committees" are remarkable for their impersonality. They are designated by captions only: "Sanitary," "Contagious and Infectious Diseases," "Drainage and Sewerage," "Food and Drugs," "Vital Statistics," and "School Hygiene." They are all, except the last named, of the same general character as the one already referred to, on Drainage and Sewerage—confined to the requirements of outcropping results of neglected conditions. Even the report on vital statistics is a mere summary of "the receipts of vital statistics," without so much as even a note on morbility with relation to age, sex, occupation, or locality.

The Sanitary Committee's report occupies over three hundred pages, with fourteen special reports on investigations and work accomplished through employés, thirteen of them on as many nuisances in various degrees (the other one being on the condition of the New York aqueduct), to which the Board's attention has been chiefly limited, but has nevertheless done much excellent work in the removal of filth and the promotion of pure water supplies.

The unsanitary condition of the public schools throughout the State is creditably exposed by tabulated statements of the health officers, in reply to a circular by the Secretary of the Board covering the salient points—ventilation, heating, lighting, drainage, closets, and present needs. In this work the Board is said to have the hearty co-operation of the Superintendent of Public Instruction, who declares it to be his purpose to ask for such legislation "as will enable and require boards of education and trustees to remedy the existing evils."

The disgraceful condition of the quarantine establishment, though menaced by cholera throughout the year, is not even alluded to, though the Health Officer is *ex-officio* member of the Board. Cholera also is completely ignored, it, fortunately, not having been reported at hand, and *then* requiring a special messenger to look after it and make inquiries with regard to the requirements for its exclusion.

The *Bulletin* for the month of November, 1887, reports

the total mortality of 126 towns of 3000 inhabitants and upward, comprising a population of about 3,500,000, for the month, 7292, the percentage of mortality under five years being 29.7. From zymotic diseases there were 1421 deaths, or 200.00 per 1000 total mortality. Of these 16.00 per 1000 total mortality were from diarrhœal diseases; 20.00 from typhoid-fever; 115.62 from diphtheria, the average for the year being 60.54. In the 120 specified localities diphtheria is reported from 60, causing about 12 per cent of all deaths; in the smaller towns not specified, 8.5 per cent of the deaths were from this cause; about 60 per cent of the zymotic mortality is from diphtheria. Small-pox has recently appeared in Albany, at present limited to one house; the origin is traced to New York. From consumption the death-ratio per 1000 is 132.05, and 188.22 per 1000 above the age of five years. The combined death-ratio from consumption, zymotic and puerperal diseases is 336.00. The death-rate from acute respiratory diseases is 144.58. In Oneonta (5000) no deaths occurred during the month.

New York City, 1,481,920: Deaths, 2759, representing an annual death-rate of 22.62. Deaths under five years, 975, 35.3 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 9; typhoid-fever, 26; malarial diseases, 25; small-pox, 2; scarlet-fever, 55; measles, 22; erysipelas, 10; whooping-cough, 7; croup and diphtheria, 279; diarrhœal diseases, 64; zymotic diseases per 1000 deaths from all causes, 181. Consumption, 419; acute respiratory, 489; puerperal diseases, 25.

Brooklyn, 757,755: Deaths, 1350; death-rate, 22.20; deaths under five years, 465—34 per cent of total. From zymotic diseases: Typhoid-fever, 27; malarial diseases, 29; scarlet-fever, 25; erysipelas, 4; whooping-cough, 6; croup and diphtheria, 185; diarrhœal diseases, 15; zymotic diseases per 1000 deaths from all causes, 215.15. Consumption, 173; acute respiratory diseases, 239; puerperal diseases, 9. Small-pox reported under that head on a preceding page.

DR. W. C. OTTERSON, the efficient Deputy Commissioner of Health, was recently waited upon by a delegation of the department attachés and made the recipient of what purported to be a chess-table—of which game he is an enthusiastic dev-

otee—but which by a multiplicity of changes can be made to do service for almost any known game from "Fox and Geese" to "Poker."

On it was the inscription: "Presented to Dr. W. C. Otterson by his friends in the Department of Health, Brooklyn, January, 1888."

The whole thing was a genuine surprise to the deputy, and in reply to the happy presentation speech of Dr. J. Fred. Moore, he showed a hearty and visible appreciation of the regard and warm esteem of his co-workers as evidenced by their gift.

Buffalo, 202,818 (for four weeks ending November 26th): Deaths, 294; death-rate, 18.85; deaths under five years, 108—36.7 per cent of total. From zymotic diseases: Cerebro-spinal meningitis, 1; typhoid-fever, 6; malarial diseases, 1; scarlet-fever, 5; measles, 2; whooping-cough, 3; croup and diphtheria, 44; diarrhœal diseases, 3; zymotic diseases per 1000 deaths from all causes, 217.00. Consumption, 24; acute respiratory diseases, 31; puerperal diseases, 1.

Rochester, 110,000: Deaths, 146; death-rate, 15.92; deaths under five years, 46—32.2 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 5; croup and diphtheria, 24; diarrhœal diseases, 1; zymotic diseases per 1000 deaths from all causes, 205.48. Consumption, 17; acute respiratory diseases, 12; puerperal diseases, 1.

Albany, 96,000: Deaths, 166; death-rate, 20.75; deaths under five years, 44—26.5 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 7; scarlet-fever, 3; measles, 1; croup and diphtheria, 20; diarrhœal diseases, 6; zymotic diseases per 1000 deaths from all causes, 228.90. Consumption, 26; acute respiratory diseases, 22.

Syracuse, 78,000: Deaths, 81; death-rate, 12.46; deaths under five years, 20—23.2 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 1; malarial diseases, 1; measles, 1; erysipelas, 2; croup and diphtheria, 9; zymotic diseases per 1000 of total, 174.20. Consumption, 13; acute respiratory diseases, 12; puerperal diseases, 6.

Lowest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the lowest death-rates during the month of November, were Jamestown (14,000),

8.57; Gloversville (10,000), 9.60; Auburn (26,000), 10.62; Binghamton (25,000), 12; Syracuse (78,000), 12.46. Oneonta, a town of 5000 inhabitants, as above reported by the Secretary of the State Board, no death during the month.

Highest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the highest death-rates during the same month were Amsterdam (14,000), 34.60; Poughkeepsie (20,200), 27.92; Long Island City (21,000), 25.71; Ogdensburg (11,000), 25.09; Saratoga Springs (10,000), 24. The highest of any town or city reported was that of Worcester (3000), 36 deaths per 1000.

NORTH CAROLINA.—The December *Bulletin* gives a summary of the returns from 49 counties—just one half of the counties of the State, within the time prescribed by the law—for the month of November, during which period there was no epidemic prevalent in the State. In 8 counties there was diphtheria; in 16 counties, typhoid-fever; in 8 counties, catarrhal-fever; in 5 counties, whooping-cough; in 3 counties, measles; in 2 counties, remittent and intermittent-fevers; in 2 counties, pernicious malarial-fever; in 5 counties, pneumonia; in 2 counties scarlet-fever; in 2 counties, dysentery. In some of these counties there was only one or a very few cases of the diseases mentioned.

Three jails are reported in bad condition; several are reported in progress of improvement. One poor-house is reported to be bad, and many are reported as improved or under improvement.

Wilmington: population—white, 9900; colored, 13,500—23,400. Death-rates: white, 12.1; colored, 24: 18.9.

Charlotte: population—white, 6000; colored, 5000—11,000. Death-rates: white, 12; colored, 19.2: 15.3.

Asheville: population—white, 4641; colored, 2607—7248. Death-rates: white, 20.06; colored, 9.20: 16.5.

Durham: population—white, 4500; colored, 2500—7000. Death-rates: white, 16; colored, 19.2: 17.1.

Fayetteville: population—white, 2500; colored, 1800—4300. Death-rates: white, 9.06; colored, 20: 13.9.

Raleigh: population—white, 8000; colored, 7000—15,000. Death-rates: white, 24.0; colored, 24.0: 24.20.

Tarborough: population—white, 1300; colored, 1200—2500. Death-rates: white, 9.2; colored, 30: 19.2.

The *Bulletin* reflects the improved health of the accomplished Secretary, for which THE SANITARIAN and all its readers rejoice.

OHIO weekly health *Bulletin* for five weeks ending November 25th reports cases of measles, 196; diphtheria, 205; scarlet-fever, 68; whooping-cough, 73; typhoid-fever, 106; typho-malarial-fever, 135; cholera infantum, 14; and other diarrhœal diseases, 271.

Cincinnati, 325,000: Deaths during the month of November, 625; under five years, 159. From zymotic diseases, 208: Croup and diphtheria, 33; typhoid-fever, 135! Consumption, 83; pneumonia, 46. Death-rate, 23.07.

Cleveland, 210,000: Deaths during the month of November, 329; under five years, 116. From zymotic diseases, 90: Croup and diphtheria, 55; typhoid-fever, 19. Consumption, 39; pneumonia, 17. Death-rate, 18.63.

Columbus, 90,000: Deaths during the month of November, 102; under five years, 31. From zymotic diseases, 21: Diphtheria and croup, 11; typhoid-fever, 4. Consumption, 12; pneumonia, 5. Death-rate, 13.6.

Toledo, 76,000: Deaths during the month of November, 79; under five years, 31. From zymotic diseases, 12. Consumption, 2; pneumonia, 4. Death-rate, 12.47.

Dayton, 50,000: Deaths during the month of November, 62; under five years, 25. From zymotic diseases, 14: Diphtheria and croup, 6; typhoid-fever, 3. Consumption, 8; pneumonia, 6. Death-rate, 26.88—the highest death-rate of any one of the 24 towns reported for the month. The lowest is that of Warren (6000), at the rate of 2 per 1000 per annum. The average annual death-rate of the whole 24, comprising a population of 946,611, is 14.75.

PENNSYLVANIA.—*Philadelphia* reports for four weeks ending November 26th, 1388 deaths in a population estimated at 993,801, of which 408 were under five years of age. Death-rate, 18.1 per 1000. From zymotic diseases there were 169 deaths, and from consumption, 189.

Pittsburg reports for four weeks ending November 26th, 312 deaths in a population estimated at 200,000, of which 122 were under five years of age. Death-rate, 19.5 per 1000. From zymotic diseases there were 60 deaths; from consumption, 22.

RHODE ISLAND.—*Providence* reports for the month of November 191 deaths in a population estimated at 121,500, of which 57 were under five years of age, and representing an annual death-rate of 18.86 per 1000. From zymotic diseases there were 55 deaths, and from consumption, 20.

TENNESSEE.—The State Board *Bulletin* reports for the month of November a continuation of the unusually good health which has prevailed throughout Tennessee during the current year. Typhoid-fever, which in quite a number of the Western States has prevailed to an alarming extent, in connection with excessive drouth, has touched this State but lightly. Local drouths have prevailed, but do not seem to have influenced health. The principal diseases, named in the order of their prevalence in the State for November, were pneumonia, malarial-fever, catarrhs, bronchitis, consumption, rheumatism, dysentery, and cholera morbus. Typhoid-fever was reported in the counties of Bradley, Cannon, Carroll, Cocke, Davidson, Dyer, Fayette, Franklin, Gibson, Hamilton, Marshall, Putnam, Shelby, Stewart, and Sumner. Whooping-cough in Cannon, Davidson, Fayette, Franklin, Humphreys, Macon, McMinn, Morgan, and Overton. Diphtheria in Davidson, Franklin, Lawrence, Madison, Morgan, and Shelby. Measles were reported in Cannon, Dyer, Humphreys, McMinn, and Sumner. Roseola in Obion and Williamson. Erysipelas in Fayette and Putnam. Mumps in Moore, and scarlet-fever in Shelby.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows:

Chattanooga,	white,	12.00;	colored,	25.84 :	16.86
Clarksville,	"	16.80;	"	12.00 :	15.00
Columbia,	"	.00;	"	12.90 :	5.41
Knoxville,	"	9.79;	"	22.08 :	12.31
Memphis,	"	14.32;	"	29.82 :	19.82
Nashville,	"	9.46;	"	17.02 :	12.13
Tullahoma,	"	4.61;	"	20.00 :	7.50

The main features of the weather during the month of November were the small amount of rainfall, the almost entire absence of electrical disturbance, the large percentage of clear days, and the smoky atmosphere which prevailed during the second decade. The month, taken altogether, was remarkably pleasant.

The mean temperature was 47.1°, about the normal for November of the past five years. The highest temperature recorded was 80°, on the 4th, and the lowest was 10°, recorded on the 20th, 21st, and 28th, and was the lowest November minimum since 1883. The highest monthly mean was 62.6°, at Memphis, and the lowest, 32.8°, at Lawrenceburg. The daily ranges of temperature were generally much greater than usual, the greatest being the remarkable range of 51°, on the 27th, at Austin. During the month four cold wave warnings were received—viz., 17th–18th, 19th–20th, 23d–24th, 26th–28th, all of which were fully verified, except the warning of the 23d, which did not materialize. There were two cold waves during the month for which no warnings were received—viz., the 5th –6th and 10th–11th. In the first the temperature fell 30°, and in the second it fell 27°.

The mean precipitation was 1.57 inch, much below the November normal, and the smallest November mean during the past five years, except in 1884, when it was about the same.

The *Bulletin* contains an excellent review of the proceedings of the recent meeting of the American Public Health Association in Memphis, by Dr. E. A. Cobleigh, Secretary of the Board of Health of Chattanooga, republished from the *Daily Commercial* of that city, well worthy the widest distribution; for although the Association has been in existence and has held annual meetings ever since 1872, it is so rare to see notices of its proceedings in the public press, so well calculated, as the one here reproduced, is to impress its purposes and proceedings upon the public mind, that the *Bulletin* honors itself in honoring this effort. Moreover, it is well worthy the pages of the *Bulletin* as a means of attracting the attention of the health officers throughout the State to the subjects discussed at the meeting which enlisted the special attention of Dr. Cobleigh. They are the issues of the hour, which should,

indeed, command the attention of every person who is interested in sanitation, whether he is engaged in the health service or not.

VIRGINIA.—*Richmond* reports for the month of November 149 deaths in a population estimated at 100,000, of which 55 were under five years of age, and representing an annual death-rate of 17.88 per 1000. From zymotic diseases there were 31 deaths, and from consumption, 9.

WISCONSIN.—*Milwaukee* reports for the month of November 244 deaths in a population estimated at 180,000, of which 68 were under five years of age, and representing an annual death-rate of 17.1 per 1000. From zymotic diseases there were 43 deaths, and from consumption, 17.

LITERARY NOTICES.

CYCLOPÆDIA OF AMERICAN CONTEMPORARY BIOGRAPHY: "Including notices of men and women of the United States prominent in the life of to-day. To be issued in ideal volumes of about 550 pages each, brevier type, including numerous portraits. To be revised and reissued as often as annually. Subscribers to early editions to have the privilege of exchanging for last editions by paying half price in cash. Volumes bound in fine cloth; price, $1; postage, 12 cents. Specimen pages free.

"The editorial supervision of the Cyclopædia will be in charge of authors and journalists of such experience and skill as will insure proper fulness of detail, within judicious limits, also such accurate and interesting presentation of facts as will make the work not only valuable for reference, but of great popular interest.

"The editors and publishers unite in soliciting the co-operation of all who are interested in the publication of a really great and comprehensive American biographical cyclopædia. Suggestions as to names proper to be included, biographical data concerning them, or references to the best sources for

information, also photographs or other portraits of prominent characters will be thankfully received."

Concerning the magnitude of the work, the publishers do not yet give definite information. But it is intended to meet the requirements of the greatest number of intelligent readers, making such distinctions as the name and fame of individuals justify. New York: John B. Alden.

HEALTH LESSONS. A PRIMARY BOOK. By JEROME WALKER, M.D., author of "Anatomy, Physiology, and Hygiene: A Manual for the Use of Colleges, Schools, and General Readers;" Lecturer on Hygiene at the Long Island College Hospital, and on Physiology and Hygiene at the Brooklyn Central Grammar School; Consulting Physician to the Brooklyn Sea-Side Home for Children, etc. 12mo, pp. 194. New York: D. Appleton & Co.

Few persons have had such good opportunities as the author of this book for understanding the needs of children under all circumstances; but fewer still, we opine, will be the number of persons who take an interest in the welfare of children—and who does not?—and get this book, as they all should, who will not fall in love with it; for of all the little books for little people—just old enough to begin to learn something about their bodies and minds and how to take care of them—this is by all odds the best hitherto published. Object lessons by numerous illustrations enliven the text and practically apply the cardinal principle that play is no less essential to healthful education than work, and that that school or household, as the case may be, which neglects to supply entertaining diversion to young minds is not suited to their healthy development. Every one of the sixteen lessons, or chapters, into which the text is divided concludes with a series of recitation questions, by which the pupil can review his knowledge and conveniently test it; but besides these there is an abundance of room for additional elaboration and application, which all good teachers will recognize. Appended is a chapter on "Accidents, Injuries, and Poisons," with which the sooner all children become familiar the better.

SIX HUNDRED MEDICAL DON'TS; OR, THE PHYSICIAN'S UTILITY ENHANCED. By FERD C. VALENTINE, M.D., ex-

Surgeon-General Army of Honduras; Member of the Medical Society of the County of New York; of the Medico-Legal Society; of the American Association for the Advancement of Science, etc.; author of "Central American Medical Curiosities," "Las Leyes Sanitarias," and other publications. 12mo, pp. 144. New York: G. W. Dillingham. With so many "don'ts," it is perhaps unreasonable to expect them all to be acceptable, for it is clear that some of them are based upon hearsay instead of competent knowledge. For example: "Don't, if you can avoid it, enter a hospital unless it is on the pavilion or cottage-plan." While the cottage-plan is unquestionably the best, there are certainly many good hospitals not so constructed.

"Don't hesitate to call disease 'sin;' it may be your sin, your parents', your grandparents', or great-grandparents'; it *is* sin"—is a heresy; closely allied to the heresy of remedial specificity, and equally false; both alike imply that this world was intended to be the everlasting dwelling-place of mankind. But there are not many such—just enough to suggest that they should be practised *cum grano salis.*

DR. BUCKLEY, editor of the *Christian Advocate*, will have another important article in his series in the February CENTURY. The doctor this time writes of "Astrology, Divination, and Coincidences," and shows the connection of these matters with the general argument he is carrying on in relation to mind cure, spiritualism, etc.

HANDBOOK OF TREATMENT. By WILLIAM AITKEN, M.D. (Edinburgh), F.R.S., edited with notes and additions by A. D. Rockwell, A.M., M.D., pp. 444. New York: E. B. Treat.

Dr. Aitken's "Science and Practice of Medicine" has always been a standard work, and the chapters on Treatment in the last edition form the basis of this Handbook. Revised and rearranged by the editor, we have a concise and comprehensive index to the treatment recommended by the best authorities for every recognized disease.

It being taken for granted the physician knows the disease he has to cope with, he here has, in a nutshell, an ever-ready armament on which he can rely to win the victory.

The name "Aitken" is sufficient guarantee of its value.

TRANSACTIONS OF THE LOUISIANA STATE MEDICAL SOCIETY, NINTH ANNUAL SESSION, HELD AT ALEXANDRIA, April 11th–13th, 1887. Pp. 247. Dr. P. B. McCutcheon, New Orleans, Secretary. First following the usual routine of opening exercises and minutes of the proceedings, which take up fifty-two pages, is a brief address by the President, Dr. D. R. Fox, of Jesuit's Bend, on "The Importance and Necessity of Medical Organization." He illustrates his subject by citing prominent examples of scientific progress by means of such co-operative work as organization affords, and closes with special reference to the importance of a registration law and the necessity of urging this subject upon the attention of the Legislature. Next follows the "Annual Oration—Human Life," by W. H. Jack, Esq. "Some Personal Reminiscences of Early Epidemics in New Orleans," by Dr. J. P. Davidson, is a particularly interesting historical sketch by an excellent observer and medical practitioner in that city for fifty-five years, and whose observations began as a hospital student in 1829. Little or no attention seems to have been given to preventive measures against the terrible epidemics of that city until within the last twenty years, as, indeed, in most other places in the United States. Dr. D. R. Fox also gives a brief historical paper on "Cholera as it Occurred in Concordia Parish in 1849." Besides these, there are fourteen other papers, all relating to curative medicine, and of but little interest to sanitarians.

TRANSACTIONS OF THE MEDICAL ASSOCIATION OF MISSOURI, NINTIETH ANNUAL SESSION, Macon City, May 10th, 1887. Dr. W. E. Evans, Boonville, Secretary. Pamphlet, pp. 159. The "Address of the President," J. W. Jackson, M.D., of Kansas City, urges the importance of better attendance of, and more interest in society organizations as incentives to professional education and practice, and increased influence in the community. B. F. Hart, M.D., of Brownsville, contributes a particularly interesting paper on "the Proper Food of Infancy and Childhood, and Needful Sanitary Environments," dwelling upon the importance of mothers' milk, better nursing, cleanliness of food utensils, and proper clothing. J. M. Allen, M.D., of Liberty, contributes a paper on "State

Medicine." He advocates such additional legislation as will strengthen the State Board of Health; extend its scope and usefulness; require instruction in hygiene and physiology in the schools; complete registration of vital statistics and a "State Department of Public Health," co-ordinate with other branches of the State Government. "Milk as a Source or Medium of Infection," by Garland Hunt, M.D., of St. Louis, concisely rehearses the well-attested sensitiveness of milk to a foul atmosphere, and the changes to which it is subject in secretion by food, drugs and disease. The methods of preserving milk and the advantages of condensed milk are also well described, and verified by quotations from the best authorities. Report of the State Board of Health, by Dr. J. D. Griffith, of Kansas City, explains how the appropriation for the support of the board ordered at the previous session of the Legislature was lost through an apparent clerical error, and urging the members of the Medical Association to use their influence with the succeeding Legislature and the Governor to correct it. It seems that the Governor is well known to be in favor of sustaining the board, and if the medical profession will interest themselves with the Legislature there is reasonable hope that the needful appropriation will be made. There are about a dozen other papers and reports on medical and surgical practice.

PRIZES FOR ESSAYS ON MEDICO-LEGAL SUBJECTS.

The Medico-Legal Society of New York announces the following prizes for original essays on any subject within the domain of medical jurisprudence or forensic medicine:

1. For the best essay—one hundred dollars, to be known as the Elliott F. Shepard Prize.
2. For the second best essay—seventy-five dollars.
3. For the third best essay—fifty dollars.

Competition will be limited to active, honorary, and corresponding members of the Society at the time the award is made.

All persons desiring to compete for these prizes will please forward their names and addresses to the President or Secretary of the Medico-Legal Society of New York.

THE SANITARIAN.

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THE MISSION OF THE SCIENCE OF MEDICAL JURISPRUDENCE.

SECOND INAUGURAL ADDRESS OF AMOS G. HULL, ESQ., BEFORE THE SOCIETY OF MEDICAL JURISPRUDENCE AND STATE MEDICINE, NEW YORK, JANUARY 12TH, 1888.

WITH great gratitude for your indulgence and support in the past, I enter upon my official duties, by your kindness, as president of this society for another year.

Why should I say gratitude?

Does the imposition of much labor and much care and attention invoke gratitude? Yes, if the labor is agreeable and instructive, and has for its object the promotion of the public good. For the honor conferred I can only lay before you the homage of a sincere and unselfish heart.

The Mission of the Science of Medical Jurisprudence is my theme.

In the study of any scientific subject it is of vital importance that we obtain a clear and definite understanding of the terms and definitions employed. Before entering upon the discussion of the mission of the science, let us see if we understand or comprehend its scope?

What is the purpose and scope of the science? What does it embrace? What does it teach?

To answer this let us refer to the writings of the early fathers on the subject, and see what they understood it to comprehend.

One of the greatest of the early works on the subject ap-

peared at Rome about the year 1621. It was written by Paulus Zacchias, who rose to great eminence in his profession. His book was entitled, "Questiones Medico Legalis," or "Legal Medicine." I have had the pleasure of examining the book through the politeness of Dr. Spitzka, who has a copy in his library. The subjects on which he wrote were: Age, Legitimacy, Pregnancy, Superfœtation, Death During Delivery, Resemblance of Children to their Parents, Dementia, Poisoning, Impotence, Feigned Diseases, The Plague and Contagion, Measles, Rape, Fasting, Wounds, Mutilation, Salubrity of the Air, and subjects relating to sanitation.

Thus it will be seen that this early writer and great author, under the title "Legal Medicine," or medical jurisprudence, embraced that which some of the members of this society are pleased to call "State Medicine."

An unhappy error was made in naming our society. It is called "The Society of Medical Jurisprudence *and* State Medicine." The name is misleading. The conjunctive word "and" would imply that two distinct sciences were intended to be named. On the contrary, I contend that the designation "Medical Jurisprudence," and the words "State Medicine," as applied to the subject-matter under consideration, are convertible terms, and are only another designation for the same thing—a proposition which, I think, can be sustained by reason and authority.

Since the great work of Zacchias, some ninety different European authors have written books upon this subject. Germany has taken the lead. The Germans have lately applied the term "State Medicine" to the whole subject.

I prefer the name "Medical Jurisprudence," because it has been in use among English-speaking people for more than two hundred years, and ought to be well understood, and for the reason that innovation is not desirable except for some good and controlling cause.

One of the first authors or pamphleteers, on this subject in this country, whose writings have come within my research, is the illustrious Dr. Benjamin Rush, of Philadelphia, one of the signers of the Declaration of Independence; one of the framers of a constitution of government which is the sublimest work of human wisdom.

He took the ground that laws for the prevention of disease, or sanitary laws, came within the realm of medical jurisprudence.

The late Dr. T. Romeyn Beck, of Albany, whose work on this subject was first published in 1835, which had reached the tenth edition in 1850, and has been translated into several foreign tongues, a work which has shed lustre upon his name and honor upon his country, limited his two large volumes to the consideration of the science in its restricted sense. (See Vol. I., p. 1, of the Introduction.) He omitted to go into that branch of the science which relates more particularly to sanitary measures and the prevention of disease.

Wharton and Stillé in their three large volumes have followed suit.

Professor Ewell, LL.D., of Chicago, who has written a good book on the subject, has made something of a departure from the plan of Dr. Beck. He has recently prepared a manual on the subject for colleges and universities. In his chapters on Mental Alienation he has drawn very largely from Dr. Spitzka's excellent work, and has had the kindness to acknowledge it.

Dr. C. M. Tidy, of London, issued two large volumes in 1883 on the subject. The work consists of a collection of cases on the same subjects treated by Dr. Beck. He merely adds a large number of new cases to those cited by Beck. The books are valuable to a lawyer in preparing his brief, or to a doctor in making his diagnosis, but are not inviting to a student who is seeking to learn the scope and philosophy of this great and useful science.

In many colleges and universities this science is not taught at all. Professor Ewell, whose books I have referred to, who graduated at a law school and also at a medical college, says that this science was never so much as referred to in either school while he was receiving his education.

It is surprising to see how little interest is felt in this science by large numbers of the medical and legal professions. I met a lawyer the other day, for whom I have much esteem, whom I knew to have been a member of the Medico-Legal Society, and inquired whether he was giving the subject attention. He replied that the science was too narrow, that about all

there was in it could be discussed in three or four meetings. He, no doubt, had attended the same law school where Professor Ewell had been educated. He, no doubt, did not agree with the great lawyer, David Paul Brown, who said that no one was fit to practice law who had no knowledge of the science of medicine, and no one was fit to practice medicine who had no knowledge of the law.

The recent discoveries of the microscope, the advancement of medical knowledge in surgery, toxicology, mental alienation, and in the prevention of disease, coupled with the necessity that a lawyer, in order to be equipped for the bar, and a doctor in order to practice medicine, should be educated on these subjects, will in the near future bring the science we are striving to promote prominently to the front.

From the early writers it would seem that this science was deemed to be the handmaid of two branches of the government—the legislative and the judicial. The courts require its aid in the elucidation of doubtful questions in courts of justice. The Legislature needs its aid in framing laws for the prevention of disease. Hence, medical jurisprudence, in its broadest scope, may be defined to be that science which the courts of justice require to assist them in the detection and punishment of crime, and which the Legislature needs to aid in the passage of laws for the prevention of disease.

Assuming this definition to be correct, let us now consider, in brief, what may be some of the objects of its mission.

First of all, we need a high standard of learning among its votaries.

What can we do toward keeping out shysters and unlearned men from the legal profession, and quacks and charlatans from the medical profession? There are such among both professions.

Shall we grumble and scold and fret about it, and make no effort to correct the wrong? He who enjoys the benefits of civilization and refinement, and inveighs against the evils and calamities of the times in which he lives, is far from discharging his duty as a citizen unless he makes some attempt to reform them.

We are on the eve of a grand opportunity to raise the standard of scholarship and learning which should be required

of a student of medicine or law before being permitted to practice.

The people of this commonwealth have with great unanimity voted to have a convention called to revise our Constitution. That convention must soon be convened. Then there will be an opportunity to engraft into our fundamental law a plan for a higher grade of learning than is now required of a student before he can practice medicine or law. This society should see that we have one doctor and one lawyer, either from our own membership or from our respective professions, in sympathy with us, in that convention.

Prior to the adoption of the Constitution of 1846 a law student was compelled to read law at least seven years before he could be admitted to the bar. I think the curriculum of study for a medical student required a longer time to complete than now. My medical brethren will correct me if I am wrong.

At that time the lawyers of this State were noted for their great learning and ability. I do not detract from the learning and ability of many of them now. About two years before the convention of 1846, a man living in one of the southern counties of the State—a hare-brained, noisy, windy politician of some property—who had come out of the little end of the horn in a long law-suit, conceived the idea that it would be a good political move to make war on the lawyers. The times were hard ; the finances of the county were in a deplorable condition. It was a good time for a demagogue to start out as a reformer. About the same time the steam doctors, or Thompsonians, as they were called, were making war, or, at least, a racket, against the doctors in several counties in Central New York. The politician started out to hold meetings in every county and town west of Albany to denounce the lawyers. He had with him a steam quack doctor a part of the time. Hence the doctors came in for their share of abuse. His plan for getting rid of the lawyers was the same as the homœopathy plan of curing disease—the hair of the same dog, or *similia similibus curantur*. He proposed to get rid of all the lawyers by making every man his own lawyer, abolishing all fees, and abolishing the Latin language. He made himself quite a lion among the farmers. The result was that out of one hundred

and twenty-seven members in the Constitutional Convention of 1846, sixty-one were farmers. They had things their own way. They attempted to make havoc of the legal profession. There were men in the convention that held them in check in a measure. The result was, the Legislature which followed that convention threw down the gates, abolished the prerequisites of study, and admitted candidates on a short examination. Hundreds were admitted about that time who had never read law books for even three months, and many that had never read a law book for a single day. Large numbers rushed for admission. The fees were reduced to starvation prices.

The folly of the scheme became apparent at once. The lawyers were in abundance, but had nothing to do.

The question will be asked, Why did the people ratify the proceedings of such a convention? The answer is, the leading journals of both parties were smarting under libel suits, and for the purpose of getting a clause inserted changing the fundamental law respecting libels, they urged the people to vote for its adoption, notwithstanding its defects. Charles O'Conor, Judge Stowe, and some other brilliant ornaments of the bar, who were members of the convention, denounced the document with fervid eloquence, and opposed it to the extent of their power at the polls. We are now suffering from its evil consequences.

Soon thereafter steps were taken to amend those laws and to amend the Constitution. It has been so amended that now only two years are required instead of seven.

I have in my possession the prospectus of a law school in this State, where it is advertised that only one year and nine months are required in order to obtain admission to the bar.

What is the result? Why, to fearfully overcrowd the profession, of course. I am not here to slander the lawyers. I love my profession. David Dudley Field, in an address delivered in Buffalo in 1886, on this subject, set forth some valuable statistics. He estimated the number of lawyers in this State to be 11,000, that about 7000 have offices in the city of New York. He says France, with a population of 40,000,000, has 6000 advocates and about 1100 notaries. Germany, with a population of 45,000,000, has 5000 advocates,

and about the same number of notaries as in France. So that the proportion to the whole number of the population in France is 1 to 4762, and in Germany 1 to 6423, while in New York we have 1 to every 455. Make allowance according to the census for women and for children under the age of twenty-one years, and you have 1 to about every 30 male persons. Deduct, say, three fourths for non-litigants, and you have 1 for every 5 persons.

Whether Mr. Field's statistics are absolutely correct or not I have not had the time to verify. I believe they are substantially correct. One thing we do know, that such a state of facts must necessarily show that hundreds of lawyers are out of employment. It is safe to say that more than a thousand lawyers in this city to-day are not earning enough to pay for a comfortable support over and above their current expenses. The result is, that those who have wealthy relations, as many have, depend upon them for help, and many are compelled to seek business on the degrading principle of the quack doctor —no cure, no pay.

The remedy for all this may be found in the approaching Constitutional Convention, by which it is to be hoped that provision may be made that no one shall enjoy the honor, the franchise, the office of attorney and counsellor at law without having been compelled to embrace within the curriculum of his studies classical, scientific, and legal knowledge, which will require at least seven years of close attention to accomplish, and not then until after a careful examination by competent judges, who shall indorse his qualifications.

We have a right, as a society, to be heard in the councils of that convention.

In respect to the qualification of medical students to enter upon their responsible duties as doctors in the prevention and cure of disease, I am not conversant with the conditions required.

I have heard rumors that many of you doctors think that a higher standard of qualification should be demanded. I have never yet attempted to base an argument upon rumors, and hope I never shall. That matter is more properly within the scope of duty devolving upon the medical profession. If they find it necessary to move on that line, they will find their

legal brethren in this society, I trust, shoulder to shoulder with them.

With all the faults and imperfections of doctors and lawyers, it will never come to pass until such time as man shall have absolute immunity from accident or ills, that the skilful surgeon and the patient physician will not be a harbinger of good at the bedside of him who is racked with pain or languishes with disease.

And while men have rights to be protected or wrongs to be redressed, muniments of title to be established or property to be preserved, the faithful, the learned, and conscientious lawyer will be found to be an indispensable and useful member of society.

Another mission of this science is to devise laws and adopt measures for the prevention of disease. This opens a vast domain for useful work.

On the 17th day of November last I had the pleasure of hearing an address before the Academy of Medicine, in these halls, by Dr. Andrew H. Smith, entitled, "The Family Physician of the Future." A copy of that paper ought to be on the library-table of every doctor, lawyer, and clergyman of this city.

He pronounced this epigram:

"The science of medicine is but a fragment of the far greater science which has for its subject the physical well-being of mankind."

He then went on to illustrate how much more important it is to prevent disease than to merely learn the art for its cure.

To acquire the knowledge, the wisdom, the power which will enable us to prevent disease is one of the most exalted missions of this science. We have nothing to do with its cure. The art of curing disease is one thing, the science for its prevention is quite another.

Municipal law has given us valuable assistance in the matter of nuisances which affect the public health, and ample remedies to those who suffer from private nuisances, as such. But the avarice, the cunning, the depravity of man has enabled him to seek out many inventions the effect of which is to destroy our comfort and produce disease.

We are all interested to know that the air we breathe is not

contaminated with germs of disease or noxious elements that destroy our comfort and health. Hence our mission is to make war on nuisances. We are all interested to know that the water we drink, the bread we eat, the beef we cook, the beverages we drink, the sweets we use, the odors we enjoy, the medicines we take, have not been adulterated or poisoned.

To this end we must be prepared to resist and circumvent the cupidities of dealers in those articles, and to see that the most stringent laws are enacted and enforced against those who perpetrate such iniquities. We must have in each session of the Legislature at least one good doctor and a good lawyer, who will guard the public interests in this respect.

We must see that Boards of Health throughout the State are equipped with good doctors of a non-partisan character. It is a disgrace to this State to see politics interfere in the matter of selecting the guardians of the public health. It is a shame to see a layman appointed the president of a Board of Health. If he had any patriotism or self-respect a layman would never accept such an office.

When we reflect that the medical profession, in giving a definition of their science, place the prevention of disease first, and esteem it of more importance than the art which has in view its cure, it is a marvel that all educated and intelligent men do not put shoulder to shoulder with the doctors by all practicable means in the accomplishment of a matter so much to be desired.

It is true that it is not wise to stand in constant fear of disease, of plagues and epidemics. But when we reflect what a narrow escape we had from the scourge of cholera last summer, as was shown by the report of Dr. Shakespeare, of Philadelphia, in respect to our quarantine affairs and their defects, we cannot but feel a little uneasy until something is done to remedy the evil. The illustrious Edmund Burke once said: "Reasonable fear is the mother of safety."

Paint this life with as many rainbows as you please, we cannot disguise the fact that it is a continued warfare. The doctors are compelled to defend themselves from the assaults of quacks and charlatans. It is not all sunshine with them.

The great Dr. Benjamin Rush, to whom I have already referred, was assailed by a paper called the *Porcupine*. He was

compelled to suffer the sting of its quills for a time. Our Dr. Hammond is having a cotillon with quackery. Dr. Spitzka has been put through the furnace of detraction, but he came out without even the smell of fire on his garments.

The lawyers have to contend against shysters and pettifoggers.

Pure and undefiled religion is compelled to contend with the selfishness, superstitions, ignorance, bigotry, and depravity of man.

Society and law and order has deadly foes in the criminal classes. A perpetual war is going on in that direction. Calumny and slander is as rampant now as when Shakespeare said :

> "No rank or greatness in mortality can censure 'scape,
> Back wounding calumny the whitest virtue strikes;
> No king so strong can tie the gall up in a slaud'rous tongue."

But are we to retreat from this warfare? Shall we surrender to the criminal classes? Shall quackery and charlatanism take the place of medical science? Will the legal profession abandon its honorable position? By no means. The war must go on.

It was my purpose to review the papers that have been read during the past year. But as they have not all, as yet, been published, and as I have not had access to them all, and as they will, no doubt, soon be printed, I have deemed it best to devolve that duty upon my successor.

Eight valuable papers have been read during the year, and about twenty new members added to our society.

While the marvellous discoveries of late in the other sciences are astonishing the world, let us hope that this science will not lag in its race for usefulness.

In conclusion, permit me to congratulate this society upon its constantly increasing membership, upon its freedom from debt, its sound financial condition, and upon the harmony that prevails in its councils. May it long continue.

PROFESSOR JAMES L. CABELL.—Never has it been our pleasure to record a tribute more worthily bestowed to virtue, honor, and science than the following notable scene which was enacted at the University of Virginia, on December 21st, 1887.

On that day James L. Cabell, M.D., LL.D., Professor of Physiology and Surgery in the Medical Department of the University of Virginia, completed fifty years of continuous professional service in that institution. This event was commemorated by the presentation to him, on the part of his colleagues and former pupils, of a solid gold goblet appropriately engraved. This was accompanied by an address on vellum. The students of the present session also gave him a handsome desk with revolving top. The following are the inscriptions on the goblet (on the front of the cup), beneath the coat-of-arms of Virginia:

"Presented to Dr. James L. Cabell, Professor of Physiology and Surgery in the University of Virginia, by his colleagues and his former pupils, with kindest regards and best wishes, in commemoration of the completion of fifty years of continuous professional service in the University."

(On the back of the cup), beneath a monogram of the letters J. L. C.

"Nihil opinionis causa, omnia conscientiæ fecit."

(On the foot of the cup.)

"December 21st, 1887."

In the language of Dr. William C. Dabney, of the University of Virginia, in which we heartily concur, "Few men in this day and generation have been as universally honored and esteemed, and it may be safely affirmed, I think, that no one in our profession has done more to elevate the standard of medical education." It is certainly meet and proper that this distinguished physician and successful teacher should thus be honored. If we should express what we owe to Dr. Cabell, our former teacher, the language appropriate might seem that of exaggeration. Says one of the most eminent scholars of this country: "In every grade of teaching, it is, perhaps, even more important to consider what your teacher is than what he knows." And such is the character of Dr. Cabell that in his teaching the impress upon the minds of his pupils has ever been of an elevating and ennobling kind, which has borne good fruits in after life. May he long be spared to be an ornament to his profession and to the chair which he has so ably filled at the University of Virginia!

EDUCATION IN THE UNITED STATES.

ABSTRACT OF THE REPORT OF THE COMMISSIONER OF EDUCATION FOR 1884–85.*

NORMAL SCHOOLS.

THE tendency each year seems to be to make more and more liberal provision for the training of teachers. Where public agencies for the work are few, private institutions enter upon it with more or less success, and in sections where education depends largely upon the fostering care of the various religious denominations or other benevolent agencies, it has been seen that in no way can the work be so directly and fully promoted as by the endowment and efficient conduct of normal schools. Much of the training in these denominational schools is of a very high order, following closely the model presented in the best public normals. The present status of public and private normal schools, as regards the attendance and classification of pupils, instructors, equipment, property valuation, and appropriations, is set forth in the summary of Table III. The number of schools reported is 263, of which 131 are public normals. These had 1234 instructors and 32,130 students, nearly two thirds of the number being women. The number of graduates was 3162, of whom 1793 have since engaged in teaching. Few of these schools have extensive libraries, but as a rule they are supplied with necessary books of reference. In respect to training in music, drawing, elementary science, and gymnastics, the provision, with a few notable exceptions, is meagre, exceedingly so, when the great and growing importance of these subjects in a scheme of popular education is considered.

The private normal schools reported in the table number 132, having 842 instructors and 23,005 students, the number

* Continued from page 69, current volume.

of male students being slightly in excess of the number of female students. The number of students who graduated last year was 1366, of whom 692 have since engaged in teaching.

The proportion of private schools in which provision is made for instruction in gymnastics, elementary science, and vocal music is still smaller than that of the public schools, but in the private normal schools more attention is given to instrumental music.

The property valuation of the public normal schools appears for the first time in the tables, amounting to $7,071,990 for 30 States and 1 Territory. It will certainly not be charged, upon an examination of these figures, that there has been any extravagance in the matter of sites and buildings.

The schools under consideration differ materially in organization and conduct, as must be the case with schools adapted, as these necessarily are, to a great variety of conditions. With few exceptions the public normal schools require entrance examinations. As a rule, these examinations are limited to the branches taught in the common schools. Several schools require for admission either graduation from a high school or evidence of equivalent attainment. These obviously possess great advantage in the purely professional part of their work. In a little more than one half of all the schools professional training includes practice in a model school, and in a few instances these model schools comprise the three grades—viz., primary, intermediate, and high ; as a rule, however, the practice school is merely a primary grade school.

With respect to the character of the training imparted in the normal schools, the commissioner observes :

" There is a very general conviction among those whose experience gives weight to their opinions that secondary or academic instruction ought to be eliminated from the normal schools, or, in other words, that they should be conducted strictly as professional schools. However excellent this idea of the function of normal schools, it cannot be generally carried out at present. In many parts of our country there are no high schools nor other efficient secondary schools accessible to those intending to be teachers, and upon the narrowest interpretation of the qualifications of a teacher the normal schools must supply this deficiency. Surely no one capable of judging in the matter will hold that a mere knowledge of

the common school branches, reading, writing, and arithmetic, United States history, a little geography, and possibly less physiology, is sufficient for even the most elementary teacher, or that such limited attainments afford a suitable basis for anything worthy of the name of professional training. In the schools in which the standard of admission is low, it is indeed difficult to preserve a just balance between the time devoted to the acquisition of knowledge and to special training in the theory and art of teaching. The difficulties, however, do not appear to be insurmountable. Where the normal school is obliged to perform the function of a secondary school, students ought not to be admitted unless they give evidence of a thorough mastery of the elementary branches, with the intellectual habit that such mastery implies. Under these circumstances the course of the normal school should cover at least three years, two for general study and one for special training."

Many of our normal schools illustrate the possibility of forming excellent teachers out of pupils whose previous study has not extended beyond the common school branches. In every such case the work of the schools is characterized by thoroughness and precision.

While recognizing the necessity that very many of our normal schools are under, of combining general instruction with the special function of training teachers, the commissioner notes as an evidence of progress the increasing number of those that are able to confine themselves to professional work.

A very important part of the work of training teachers is carried on in teachers' institutes, and every year shows an increase in the number of States making appropriations from the public funds for the support of these agencies. Chairs of pedagogics or didactics are reported from Johns Hopkins University, and from the universities of Michigan, Missouri, Iowa, Wisconsin, and North Carolina.

Special mention is made of the work of training teachers to give instruction in science, as conducted by Dr. A. S. Bickmore, professor in charge of the American Museum of Natural History, Central Park, New York City. The State makes an annual appropriation of $18,000 for the service.

The *business colleges* reporting number 232, having 1099 instructors and 43,706 pupils. This is an increase of 11 over the number of schools reporting in 1884.

KINDERGARTEN.

The total number of kindergärten reported is 415, with 905 instructors and 18,832 pupils. As compared with the number reported in 1884 there is an increase of 61 schools, which increase, as may be seen by a detailed examination of the table for the two successive years, is chiefly in the South and West, Pennsylvania being the only Eastern State that participates largely in the excess. From this State 55 kindergärten are reported, as against 27 in 1884. The new schools, which are all in Philadelphia, have been established under the auspices of the subprimary school society of that city. Colorado, Texas, and Vermont appear for the first time in the table.

Illinois reports 37 kindergärten, as against 25 the previous year, the new schools having all been opened in Chicago.

California reports 34, as against 29 the previous year. The work in this State, which was described at length in the commissioner's last annual report, has been continued with equal enthusiasm during the present year. The extension of the kindergärten work to other States of the Pacific slope is largely due to the influence of the work in California, and to the efforts of teachers trained in the California schools.

Little progress has been made in the establishment of kindergärten at public expense, or as a part of the public school system; nevertheless the system has had a marked effect in improving the methods of training employed in the primary grades of public schools throughout the country.

The growing demand for kindergärten teachers causes a rapid increase in the number of training schools. Several public normal schools have added a class or department for training kindergärtners.

SECONDARY (INCLUDING PREPARATORY) INSTRUCTION.

The total number of pupils in all classes of institutions reporting under the head of secondary instruction is 265,024. Of this number, 35,307 are reported in city high schools, 160,137 in institutions for secondary instruction, and 17,605 in preparatory schools; the remainder are in institutions that do not make this grade of instruction their sole purpose—viz.,

normal schools, 10,950; preparatory departments of superior institutions for women, 6994; of universities and colleges, 31,351; of schools of science, 2680. The number of pupils reported as preparing for college (classical or scientific course) in the several classes of schools specified is 34,326.

Among the most prominent subjects of discussion during the past two years has been that of the scope and conduct of that part of education which is intrusted to the schools classed as secondary or preparatory. The advance in college standards necessitates a corresponding advance in the preparatory work; the interests of science call for a great enlargement of the curriculum, while the public have become more exacting with reference to results that conduce directly to business and industrial success.

Wise counsels, carefully elaborated plans, ample resources, and nice adjustment are more necessary here than in any other part of educational activity. Fortunately the need has already given rise to several important conferences, and to some permanent associations whose efforts are directed to the solution of the problems suggested.

With reference to the schools classed as "secondary," the commissioner observes:

"The majority of all the scholars are in the English course, and it is probable that these, together with a large proportion of the scholars not so classified, complete their education in the secondary schools.

"A great trust is therefore committed to these schools, and it is of the utmost importance that the public opinion of the communities in which they are placed should hold them up to a high standard.

"The report of productive funds alone is sufficient to indicate the need of more liberal endowments for this part of the general educational work of the country."

Of the schools classed as "preparatory" he says:

"They are a characteristic institution of the New England and Middle States, 70 per cent of the whole number reported being located in these sections. The close connection which these schools maintain with superior institutions, their endowment, and the nature of their patronage, have all contributed to the maintenance of a high standard.

"As the name 'preparative' indicates, the aim of the schools is to prepare students for college; and although the

majority of their students do not matriculate, all have the advantage of pursuing a well-systematized course of study which has been universally approved as the best possible preparation for a liberal education. The value of this training as a preparation also for practical life is abundantly illustrated by the careers of graduates who pass directly from these schools to commercial and industrial pursuits. Naturally the strength of the schools has consisted hitherto in the thoroughness of the instruction in mathematics and the classics. More recently demands have arisen in the direction of science and the modern languages. To meet these demands additional buildings, teachers, and other appliances are required, and strenuous efforts are being made by the teachers, trustees, and alumni of the leading schools to increase their funds proportionably. About one half the schools report a chemical laboratory, and more than two thirds philosophical apparatus, but, as a rule, where such provision exists it is of rather a meagre character. The centennial of Phillips Exeter Academy, one of the most noted of the schools in question, which occurred in 1883, afforded the occasion for special efforts looking to the increase of its resources and equipments. The long-cherished desire of the trustees to erect a gymnasium has been accomplished, chiefly as the result of a bequest of $50,000 from Dr. Francis Parkman Hurd, of Boston.

"The importance of such an adjunct to schools of this class cannot be overestimated, as their pupils are just at the age when physical training properly conducted is likely to yield the best result.

"By reference to Table VII. of the Appendix, it will be seen that only 66 of the schools report a gymnasium. Out of a total of 17,605 students, 4326 are reported as preparing for a classical course in college, and 1840 for a scientific course.

"A large part of the work of secondary instruction in our country is accomplished in public schools, of which with the present information it is not possible to make more than a partial exhibit. As a rule the city high schools are provided with superior teachers, and have unusual facilities for instruction in the branches that constitute what is generally termed the 'modern course,' including drawing, science, French, and German.

"Out of 148 city high schools reported, 10 are in Southern and 43 in Western cities. These figures give but a small idea of the number of public high schools or of the growth of public sentiment in their favor, as they do not include all the city high schools and none of those in rural districts.

"In the comparatively small proportion of the high schools tabulated, 13 per cent of all the scholars reported as receiving secondary instructions are enrolled."

In consideration of the public discussions of over-pressure in schools of secondary grade, and the great importance of the subject, the commissioner gives a very full report of the investigations in respect to this matter, made by Professor Axel Key in Sweden and by Dr. Hertel in Denmark.

INSTITUTIONS FOR THE SUPERIOR INSTRUCTION OF WOMEN.

For the superior instruction of women there are reported 232 schools, having 29,634 students. If to these be added the number of women students reported in co-education colleges and schools of science, we have a total of 40,907 women in advanced courses of instruction.

In respect to property valuation, and amount of productive funds for the schools considered, there has been some increase since the last year, the total being, for the former item, $10,373,897, as against $9,938,591 in 1883–84, and the latter $1,318,715, as against $1,211,665 in 1883–84. The increase seems the more considerable when it is considered that the number of schools reported the present year is 9 less than the number reported for the preceding year. Tuition fees, which are the chief source of income, amounted, so far as reported, to $1,061,529, against $926,248 in 1883–84.

The commissioner says :

" Interest in provision for the superior instruction of women shows no abatement, although the year has not been characterized by any special action in reference to the subject. The importance of full provision for this work is indeed so fully recognized that the discussions which it excites no longer turn on that question, but on those which pertain to it as a part of superior instruction in general. One of the most interesting inquiries that has arisen respecting the education of women in this country is that of the effect of college education upon their health."

The most important contribution to the discussion of this topic is the data collected by the Association of Collegiate Alumnæ, and tabulated by the Massachusetts Bureau of Statistics of Labor. In summing up the evidence, the report of that bureau says :

" In conclusion, it is sufficient to say that the female graduates of our colleges and universities do not seem to show, as

the result of their college studies and duties, any marked difference in general health from the average health likely to be reported by an equal number of women engaged in other kinds of work, or, in fact, of women generally, without regard to occupation followed."

The commissioner calls attention to the fact that the statistics tabulated by the Bureau of Statistics of Labor represent only 12 colleges and universities open to women, of which 9 are co-educational.

While they are all universities or colleges that maintain high standards, they are also so managed as to offer peculiar facilities for physical culture and for healthful living in general.

Undoubtedly the mode of life affects the health of students much more than their studies, and there is good ground for affirming that a large proportion of the institutions for the superior instruction of women are deficient in respect to the means for promoting physical vigor.

UNIVERSITIES AND COLLEGES.

Under the head of universities and colleges 365 institutions are reported as against 370 for the previous year.

There is an increase in the totals of property, valuation, income, scholarship funds, etc., from $105,347,834 to $114,986,661. But this is due in a large measure to the greater fulness with which these particulars are reported for the current year.

The year covered by the present report has been characterized by great activity in all departments of college and university work, and by free and earnest discussion of important questions pertaining to the conduct and development of these institutions. Prominent among these questions is that of the separate functions of colleges and universities. The interchangeable use of these terms leads to more or less confusion in a formal presentation of the provision made for liberal culture in the United States. With the purpose of making clear the distinctions that are recognized between the terms where they are used discriminately, the commissioner enters into a somewhat detailed exposition of the organization and work of Williams College and of Michigan University, the former

being taken as a representative of the college ideal, and the latter of one type of university. Harvard, Yale, Columbia, and Princeton are rapidly developing on the university plane. In this movement, however, the college functions are still retained, and so far it may be said that the arts course seems likely to remain a feature of university organization among us.

"Changes in the admission requirements, in the average age of college students, in the conduct of studies, and the modes of discipline [says the commissioner], are important features of recent college history in our country, and have an unmistakable bearing upon the development of the university organization; but the record of graduate departments affords the best evidence of the demand which exists for university provision, or at least of the extent to which students are now ready to avail themselves of this provision in our country."

Out of 869 graduate students reported, three fifths are distributed among eleven colleges and universities, as follows: Johns Hopkins, 174, including 37 fellows; Harvard, 80 graduate students and fellows; Princeton, 66; Yale, 37; Cornell, 29, including 7 fellows; Vanderbilt, 29; Columbia College, 23; Boston University, College of Liberal Arts, 20; Lehigh University, 17; University of Michigan, 15; University of Minnesota, 15. The University of Virginia, which bears an important part in the maintenance of a high order of scholastic work in this country, is not included in the foregoing enumeration, the peculiar organization of this university making it difficult to include any part of its work in a scheme of comparison adapted to other institutions of similar standing.

The commissioner reminds his readers that while peculiar interest attaches to the colleges and universities that take the lead in promoting the highest order of intellectual effort, the work itself depends upon the general condition of the undergraduate work throughout the country. The colleges whose force is mainly expended here include some of the oldest and most influential in the country.

During the year under review an unusual number of college presidents have resigned.

An interesting particular of the year's record is the gift of Hon. Leland Stanford for the endowment of a new university on the Pacific coast.

A special feature of the report is a table whose purpose is

best explained in the following statement by the commissioner:

"The American college has fallen into the habit of publishing little else of itself, its methods, work, results, or alumni, than appears in its annual and triennial or general catalogues. When the historical work of this office was commenced in this direction, it was found that a considerable number of colleges had not complete sets of their own catalogues. Harvard, under President Eliot, and some older colleges are now giving the public more definite reports. State universities and colleges of agriculture, in accordance with law, generally publish somewhat fully the facts in their administration from year to year, but the American college annual catalogue is much the same in all cases. In the triennial or general catalogue there is greater diversity. There is a general demand for the results of college education. What have the colleges accomplished? How far does the triennial or general catalogue give the information desired? In order to bring into the smallest possible space the data contained in these general catalogues, I have had those sent to this office carefully examined and the data grouped in the accompanying tables."

Under the head of "Schools of Science," 105 institutions are reported, having 1282 instructors and 17,086 students. Of the whole number, 47 are endowed with the national land grant of 1862. The income of these so far as reported was as follows: From productive funds, $485,692; from tuition fees, $211,120; from State appropriations, $379,240, or a total of $1,076,052.

An examination of the admission requirements of 41 of the institutions in the table shows that for 15 the studies pursued in the common schools are a sufficient preparation, while 26 call for somewhat higher attainments. In 10 of the latter, the additional requirements are the elements of algebra and plane geometry; the remaining 16 include other branches, and one requires a high-school diploma.

A comparison of the reports for the current year with those of 1880 shows for the majority of the schools marked increase in the number of teachers and in the number of students, while the large proportion of the students in the departments of industrial training is a proof that these institutions are realizing more and more fully the special purposes contemplated in the endowment of 1862. Several of these schools

have long been noted for their very complete equipment for instruction in pure and applied science. The development of such instruction in the remaining schools has been retarded by the want of laboratories and apparatus. Much has been done during the last five years to supply these costly, but indispensable appliances, so that a larger number of the schools can now be reported as fairly well equipped, while the better understanding of these necessities among the people gives hope of ampler provision in this respect in the future.

Of 56 schools reporting under the head of schools of science not endowed with the national land grant, 13 are classified as manual training schools. The increasing number of schools of this class is noticeable.

In summing up his report of schools of science the commissioner observes:

"The increased patronage and resources of the institutions presented in Table X., and their general improvement, must be regarded as both a cause and an effect of the increased interest manifested in the subject of technical training throughout the country. In respect to an understanding of the importance of such training, and to provision for the same, the United States bears very favorable comparison with foreign nations, a fact which is constantly recognized by foreign authorities. We must, however, admit that our distinction is due chiefly to provisions for training in the mechanic arts; in respect to agricultural training we are inferior to the European nations in which it has been fostered."

INDUSTRIAL TRAINING.

The great public interest now manifested in respect to industrial training has led the commissioner to make special efforts to collect information relating to provision for this work. The expression "industrial training" is employed in two senses—*i.e.*, training for industrial pursuits, and manual training as a means of general development. The most conspicuous example of an effort to develop a system of training in accordance with the latter conception is afforded by the Workingman's School of New York City, conducted by Professor Felix Adler, under the auspices of the Society for Ethical Culture. The method of the school is described somewhat in detail in the report.

Very full accounts are given of experiments in combining tool work with the ordinary course of school instruction now in progress in the following cities: Boston, Mass.; New Haven, Conn.; Philadelphia, Pa.; Newark, N. J.; Montclair, N. J.; Toledo, Ohio; Peru, Ill.; Minneapolis, Minn.; and Eau Claire, Wis. These experiments differ substantially from the manual training schools of high school grade classified in Table X.

Schools of this class are increasing among us. Since the organization of the manual training school of Washington University, St. Louis, Mo., in 1880, the following have been established:

The Baltimore Manual Training School, organized in 1883, supported by public funds.

The Chicago Manual Training School, founded in 1884 by an association of gentlemen connected with the Commercial Club of Chicago.

The Philadelphia Manual Training School, opened September, 1885, as a part of the public school system.

The Cleveland Manual Training School, incorporated June 2d, 1885. This school is supported by a stock company. Applicants for admission must be at least fourteen years of age, and be of such school grade or have acquirements equivalent to those required for admission to the city high school.

The schools and classes mentioned, however, do not meet the demand which has become quite general for some method of training which shall develop a certain degree of manual skill and a taste for manual work among all children. So far the only exercise of this kind that it has been found practicable to bring within the reach of entire school populations are drawing, clay modelling, and sewing. Sewing introduced into the grammar grades of Boston in 1876 can no longer be regarded as an experiment in that city. Every year affords increased evidence of the great value of the instruction, and shows a slight increase in the number of cities following the example of Boston. Of the 276 cities enumerated in Table II., 73 report special teachers of drawing; it is also included in the course of instruction in many other cities which make no special provision for the instruction. In a number of cities the instruction in this branch is of a high order, and its bene-

ficial effects are felt in many branches of industry; but as a rule provision for this important art is altogether too meagre and the course of instruction exceedingly defective, while modelling and design are largely neglected. The result of all experience bearing upon the subject and the testimony of all competent judges justify the assertion that drawing and modelling ought to be included in all elementary training, and the need of adequate provision for this work cannot be too persistently nor too urgently forced upon the attention of legislators and school authorities.

In several cities the influence of the public schools has been thrown on the side of industrial work executed by the pupils outside of school hours, and independently of school instruction. This has been done by arranging for exhibitions of such work, and by the distribution of prizes for the same. Moline, Ill., has gained distinction by such exhibits.

The Industrial Education Association of New York City was organized in 1884. Its object is to promote the cause of manual and industrial training, by disseminating information relating to it; by securing its introduction into schools of all grades; by training teachers and organizing classes in special branches. The work of the association is intrusted to committees which have been formed to meet the needs of the specific work assigned to each.

The disposition manifest for several years among leaders of public opinion to attribute the distaste for manual labor on the part of our young people to the influence of the public schools is passing away. Other and more probable causes of the evil are attracting attention, and other agencies are suggested for its correction. Said Professor Charles O. Thompson: "It is safe to rest upon the certain endowment of private institutions for the teaching of handicraft. Nearly $10,000,000 have been given to found institutions of technology, and mainly by private givers, since 1868, and the good work still goes on." Every year chronicles some new and important movement in this department, due to private benefactions or the enterprise of some corporate body.

Among recent instances are mentioned the New York Trade Schools, which have been in operation four years, and the Baltimore and Ohio Technological School, established by the Baltimore & Ohio Railroad Company for the promotion of

a higher course of instruction for the apprentices of the service than is now attainable. Cookery, which is included in the course of elementary instruction in several foreign countries, has thus far found no place in the common schools of the United States.

In Boston an experiment has been made which it is to be hoped may lead to permanent provision for giving girls attending the public schools instruction in this important art. In Philadelphia the ladies of the Public Education Association arranged with the Board of Education for two experimental lessons in cookery to be given by Miss Corson in the normal school of that city. The experiment was tried with the view of ultimately introducing into the public school system a department of "household science."

Schools of Theology reported, 152—with 703 instructors and 5775 students. Of the entire number of students, 23 per cent had received a degree in letters or science. The value of grounds and buildings in the possession of these schools was $6,480,003; the amount of productive funds, $10,702,287; and the income from productive funds, $653,792. One hundred and ten, or 72 per cent, of all the schools of theology, are sustained by the following denominations: Baptist, 22; Roman Catholic, 18; Evangelical Lutheran, 18; Presbyterian, 14; Methodist Episcopal, 14; Congregational, 12; Protestant Episcopal, 12.

Schools of Law reported, 49—with 285 instructors and 2744 students. The same proportion of these as of theological students—viz., 23 per cent, had received a degree in letters or science. The income of schools of law is derived chiefly from tuition fees, which amounted in 1885 to $117,639. The value of grounds and buildings in the possession of these schools was $37,000; the amount of productive funds, $195,460; and the income from the same, $13,434.

Schools of Medicine, Dentistry, and Pharmacy, whole number reported, 152, being an increase of 7 over the number reported in 1884.

Five of the 7 additional schools are included in Group I., "medical and surgical," and in a new class, "post-graduate and polyclinic," which has not been mentioned in previous reports. This new division in medical schools corresponds to the new departure in American medical education. These

post-graduate schools supply an acknowledged want in our opportunities for medical instruction, whereby men newly graduated may continue further the study of their profession, or may supplement, during a few months of study, their own experience as practitioners, by reviewing the collated and systematic presentation of all new discoveries in remedies, appliances, and methods of cure.

The number of medical schools proper has diminished by 2, 1 eclectic and 1 homœopathic school, both connected with the University of Nebraska—not appearing in this report. Four new schools of pharmacy make up this loss of numbers in the table and supply the rest of the increase noted for the year.

The number of *degrees* of all classes conferred in course in 1884 was 12,637; honorary, 549. These were distributed as follows: In letters, 4569 in course, 185 honorary; in science, 1640 in course, 16 honorary; in philosophy, 453 in course, 25 honorary; in art, 56 in course, 4 honorary; in theology, 334 in course, 204 honorary; in medicine, 4591 in course, 7 honorary; in law, 976 in course, 107 honorary.

The number of degrees noted as conferred in theology does not really represent the number of graduates in that faculty, because many of the best schools mention in their graduation certificates no particular degree as conferred on the graduate. All such cases, whenever they can be ascertained, should be classed as bachelors of divinity. As most of these graduates were also preliminarily educated in a classical collegiate course, ending with the bachelorships of arts, and as they usually receive, three years later, the mastership of arts as a matter of course, they have no need of a professional degree.

Of the grand total "in course" the learned professions obtained 47 per cent, of which theology received 3 per cent, medicine 36 per cent, and law 8 per cent. Of the honorary degrees in the grand total the learned professions obtained 58 per cent, of which theology received 37 per cent, medicine 1 per cent, and law 20 per cent. By comparing this table with that of 1880, it will be perceived that the different departments have gained, in degrees conferred, from 21 per cent to 77 per cent, with the exception of the law, which has lost 6 per cent.

Of *Public Libraries*, the summary includes 5338 as against 4503 previously reported, and a total of 20,622,076 volumes as against 13,668,855.

The Appendix table embodies the results of the effort made by the Bureau to supplement the special library report published in 1876. It is believed to be the most complete list of public libraries in the United States that has been published.

Thirty-four training schools for nurses report 153 instructors, 793 pupils, and 218 graduates in 1885; 3320 pupils since organization; and a total of 1188 graduates.

Sixty-four schools for deaf-mutes are reported from 34 States and 5 Territories. These had 516 instructors and 7295 students. State appropriations for the year amounted to $1,299,000, and income from tuition fees to $158,052. The expenditure for the year was $1,439,739.

The commissioner observes that deaf-mutism increased rapidly in the decade 1870–80, and at the same rate of increase there will be 150,000 deaf-mutes in the country in 1900. To educate 40 per cent of this number, or 60,000, the present provision would need to be greatly increased. The figures not only suggest this need, but also the importance of using all possible means to prevent the increase of the disability. To this end, as well as for the general advantage of deaf-mutes, the association of these with hearing children in special schools is advocated in many quarters. Such a measure was embodied in a bill passed by the Wisconsin Legislature, March 25th, 1885. Art and industrial training enter largely into the training of the best schools for deaf-mutes, and, as experience proves, with the most gratifying results.

There is a wide difference of opinion as to the comparative utility of boarding and day schools for the education of the deaf; as regards buildings for boarding-schools, preference is now very generally expressed for a series of small buildings, or cottages, accommodating 25 or 30 pupils each, with school-houses, shops, kitchen, and such other buildings as are required.

SCHOOLS FOR THE BLIND.

This country has now entered upon the second half of its first century of organized effort for the education of the blind. During the first half century there was a wonderful change,

not only in popular sentiment, but in the methods of instruction employed. The time was when the blind were not considered susceptible of an education; now, educators work on the principle that "they can be taught everything but to see."

To provide for the blind youth of suitable age, there are 32 institutions in the United States, to whose support every State contributes. Some of these are finely endowed, fully equipped, and amply provided with instructors. Others are doing excellent work with insufficient means and appliances, their lack being largely supplied by enthusiasm and ingenuity. In all there is manifest a singleness of aim, a progress of ideas, and a similarity of methods, which at once bespeak the intelligence of the educators and the influence of the biennial conferences.

The number of instructors employed in the schools in 1885 was 663, and the number under instruction 2377. There are three printing-houses in the United States which publish books for the blind. These books are more costly than ordinary works, and to help meet the expense of printing, etc., Congress appropriated $250,000 in 1879, the interest of which, $10,000, is distributed *pro rata* for the purpose specified.

The faculty of hearing seems to be intensified by the loss of the faculty of sight. One is not surprised, therefore, to learn that among the blind are many gifted musicians, or to discover that music is sedulously cultivated in all the schools. One institution reports the possession of 26 pianos, with other stringed, reed, and wind instruments. Every school has, entirely or in part, its harmony class, its choir, its orchestra, its band, and its corps of piano-tuners. In Boston the contract for tuning and keeping in good working order 132 pianos in the public schools has been awarded for the eighth time to the Massachusetts Institution for the Blind.

Every school is also provided with an industrial department, though from the nature of the case the training in this direction is limited. Boys are taught the making of brooms, brushes, baskets, mattresses; also upholstering, cane-seating of chairs, and weaving of rag-carpets. The girls are taught housekeeping, sewing, and knitting (by hand and by machine), crocheting, beadwork, and cane-seating.

As a class the blind are frail and delicate. To overcome this physical condition, as well as to promote self-reliance,

courage, and discipline, some of the schools have introduced the gymnasium, military drill, and calisthenics.

The training of blind pupils from the age of five to nine years by kindergarten methods, though comparatively a new feature, is already a pronounced success. It has only been adopted in three or four schools, but will probably become general.

From the census of 1880 we learn that the number of blind persons in the United States was not quite 50,000. Of these, less than 10,000 were under 20 years of age. Of course a large majority of the adult blind received an education before losing their sight. But as less than 2500 have been in attendance at the schools for the blind, there must be several thousand for whom, in some States at least, inadequate provision is made; or else, as in too many instances, these unfortunates are retained at home for various reasons. These are, chiefly, (1) a state of poverty which precludes suitable clothing and the cost of getting them to and from the institution; (2) a fear of intrusting these pets of the household to the care and sympathy of strangers; and (3) a bias (which is happily disappearing) against the idea of sending them to what they regard as an "asylum" or "hospital." It is obviously of great importance that both the blind and the deaf-mute should be induced to profit by the public provision made for their instruction.

Schools for the feeble-minded number 17, having 422 instructors and 3010 inmates. The income for the support of these institutions in 1885 was $525,110, as far as reported, and the expenditure $528,483. Thirteen States support schools of the class considered, and 5 other States have arranged by special legislation for the care of feeble-minded youth in the institutions of neighboring States.

BENEFACTIONS.

The total of donations and legacies in aid of education for 1885 amounted, so far as reported to the office, to $9,314,081. This exceeds the benefactions for any single year since 1873, when the total reported was $11,226,977. More than half the entire sum donated during the present year is for the benefit of colleges and universities. Institutions for secondary instruction receive $1,629,213, the largest amount credited to them in any year.

THE TOBACCO HABIT AS VIEWED FROM A SCIENTIFIC ASPECT A HALF CENTURY AGO.

NEWPORT, R. I., January 27, 1888.

My dear Dr. Bell:

Apropos of the subject of tobacco, treated of in a recent number of THE SANITARIAN, I send you herewith some MSS. of my father's on the subject, written a full half century ago. It has been very much admired, and if you wish, it is at your disposal for publication.

Very sincerely,

W. TH. PARKER.

Our pity, compassion, and astonishment are frequently highly excited when perusing the tales of missionaries and travellers among the heathenish nations of the Southern Pacific. We learn that, among other enormities, the betel-nut is with many of the islands an article of extensive trade, whose only use is to blacken the teeth and render hideous the faces of its consumers, and that whole ship-loads of sandal-wood are moved from place to place to supply ignorant devotees with perfumes to burn before their wooden gods. That these should be used with the most persevering assiduity solely from a vitiated habit taxes our credulity, and we join in exclaiming, When will the light of reason burst upon these benighted nations, and mind, freed from all its debasing alliances, be permitted to rush forward to its own peculiar though long-lost eminence?

The ignorant Esquimaux, to support his existence, swallows the filthy train oil, and our delicate nerves are fearfully excited by the loathsome recital; but can we receive without emotion the intelligence that a nation professing to be the most civilized and refined, the most Christian and moral on the globe, whose missionaries visit every corner of the footstool, and the spires of whose churches pierce the ether of every landscape, is *wholly* enslaved by the use, in various forms, of a narcotic

weed which ruins the health, benumbs the moral faculties, and destroys the estate? I propose to inquire briefly into the effects of such a habit, and to urge upon your candid consideration a few reasons why the use of tobacco should be wholly discountenanced by civilized countries.

In entering on a ground to myself so new, and which has been so frequently debated by men of eminent moral and intellectual attainments, I shall not rely upon my own information, but shall make free use, *by way of extract*, of those essays I have been able to consult on the subject, and from these draw whatever inferences I may think available for my purpose. It seems on consulting history that the introduction of tobacco into Europe during the sixteenth century was not greeted with a very cordial reception by those who regulated the manners and morals of communities. "The civil and ecclesiastic powers were marshalled against it, and popish anathemas and royal edicts, with the severest penalties, not excepting death itself, were issued. In the reigns of Elizabeth, of James, and of his successor, Charles, the use and importation of tobacco were made subjects of legislation. In addition to his royal authority, the zealous King James threw the whole weight of his learning and logic against it in his famous' ' counter-blaste to tobacco ; ' he speaks of it as being a sinful and shameful lust, as a branch of drunkenness, as disabling both persons and goods, and in conclusion declares it to be a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black and stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomlesse."

It happens to be a part of our natural constitution more plainly to see the inconsistencies of neighbors than to comprehend our own imperfections. From a superficial examination, or rather, perhaps, from our own self-sufficiency, we too frequently allow ourselves to settle into a state of perfect contentedness, the monotony of which is seldom broken unless by the discovery of some very marked fault in other *distant* members of the vast community of mankind. This feeling, it may readily be perceived, must be productive of anything but beneficial results on temperaments which require for their own health the most rigid self-examination.

From its irregular effects, we shudder at the supposed indelicacy of the rat-eating Chinese or at the frog-devouring appetites of the more polished Frenchmen. For the same reason, too, King Henry VIII., with the coarse wit of his time, used laughingly to say if he was going to make a feast for the devil, he would give him a boiled pig, and after it a pipe of tobacco by way of *digestion.*

In the early laws of the New England colonies decisive measures were taken to prevent its use. Increase Mather writes to his son Cotton: "My son, if smokers tempt thee consent thou not, for truly had tobacco been known at the time of the Levitical law, its use would have been prescribed among unclean sins." But this moral pestilence routed the united force of Church and State, and to this day communities remain in its ancient thraldom.

The spectacle of such a universal dereliction from integrity has justly excited the surprise and pity of the great and good. We find the great Dr. Rush (I call him great because he was a benefactor of the human race) exclaim in this manner:

"Were it possible for a being who had resided upon our globe to visit the inhabitants of a planet *where reason governed,* and to tell them that a vile weed was in general use among the inhabitants of the globe he had left which afforded no nourishment, that this weed was cultivated with immense care, that it was an important article of commerce, that the want of it produced real misery, that its taste was extremely nauseous, that it was unfriendly to health and morals, and that its use was attended with a considerable loss of time and property, the account would be thought incredible, and the author of it would probably be excluded from society for relating a story of so improbable a nature. In no one view is it possible to contemplate the creature man in a more absurd and ridiculous light than in his attachment to tobacco."

Another distinguished physical writer carries his surprise still farther, and in view of the vast prostration of moral energy and the devastation of unnatural habit, thus speaks: "In the great kingdom of living nature man is the only animal that seeks to poison or destroy his own instincts, to turn topsy-turvy the laws of his being, and to make himself as

unlike as possible that which he was obviously designed to be. No satisfactory solution of this extraordinary propensity has been given short of a reference to that

> first disobedience and the fruit
> Of that forbidden tree, whose mortal taste
> Brought death into the world and all our woe,
> With loss of Eden. . . . "

While myriads of sentient beings spread over the earth adhere with unyielding fidelity to the laws of their several existences, man exerts his superior intellect in attempting to outwit nature and to show that she has made an important mistake in his own case. Not satisfied with the symmetry and elegance of form given him by his Creator, he transforms himself into a hideous monster, or copies upon his own person the proportions of some disgusting creature far down in the scale of being. Not content with loving one thing and loathing another, he perseveres in his attempts to make bitter sweet and sweet bitter, till nothing but the shadow is left of his primitive relishes and aversions. This is strikingly exemplified in the habitual use of the narcotic or poisonous plants. Perhaps their effects upon animal life, as exhibited in experiments and recounted by the experience of those who have been its slaves, may be useful in deterring reasoning beings from farther prostitution of their physical energies. In presence of a few members of the medical class Dr. Murry performed, among others, the following experiments :

A small drop of the oil of tobacco was rubbed upon the tongue of a large cat. Immediately the animal uttered piteous cries and began to froth at the mouth. After an expiration of seven minutes another drop was applied to the tongue. In an instant the eyes were closed, the breathing was suffocative and convulsed ; in one minute the ears were in rapid convulsive motion, and tremors and convulsions were extended over the body and limbs ; in three and a half minutes the animal fell upon the side senseless and breathless, and the heart had ceased to beat. Three drops were rubbed upon the tongue of a full-sized cat. It dropped upon the floor and expired in great convulsions two minutes and three quarters after the oil was applied. Two drops were rubbed upon the tongue of a red squirrel. This animal, so athletic as to render

it difficult to secure him long enough for the application, was in a moment seized with a violent agitation of the whole body, and was perfectly dead and motionless in one minute. When applied to sensitive surfaces of considerable extent, even in a form somewhat dilute, tobacco often produces the most serious effects. The tea of tobacco has been known to destroy the life of a horse when forced into his stomach to relieve indisposition; or tea of twenty or thirty grains of tobacco, when introduced into the human body to relieve a spasm, has been known repeatedly to destroy life. So powerfully active is this pernicious weed, that the life of the unhappy patient has been destroyed by the application of a single moistened leaf to the region of the bowels. A physician was consulted by a lady in case of her daughter, who had a small ringworm at the root of the nose. Her object was to ascertain the doctor's opinion as to the propriety of making a local application of tobacco in the case. He objected to it as being an exceedingly hazardous measure, and left the house. Immediately after the doctor went away the mother besmeared the tip of her finger with a little of the *strong juice* from the grandmother's tobacco pipe, and proceeded to apply it to the ringworm, remarking that if it struck to the stomach it must pass through the nose. The instant the mother's finger touched the part affected the eyes of the little patient were rolled up in their sockets, she sallied back, and was caught in the act of falling by the alarmed mother. The part was immediately washed with cold water, with a view to dislodge the poison. But this was to no purpose, for the jaws were already firmly locked together, and the patient was in a senseless and apparently dying state. The doctor was instantly called in. He succeeded in opening the jaws so as to admit of the administration of the spirits of ammonia and lavender, frictions were employed, and everything done which at that time were thought likely to promote resuscitation; but it was an hour or an hour and a half before the patient was so recovered as to be able to speak. Till that time she had been robust and healthy, but since the tobacco experiment she has been continually feeble and sickly. For four or five years she was subject to fits every two or three weeks dangerous to her life, and lasting from twelve to twenty-four hours.

The habitual use of tobacco often occasions distressing tremors of the limbs resembling the palsy. While Dr. Franklin was ambassador in France he became acquainted with Sir John Pringle, a celebrated English physician, an inveterate snuff-taker, whose hands were trembling and the whole nervous system greatly affected. The doctor advised Sir John to leave off the use of snuff. He did so. A few years afterward Franklin met him in London entirely free from tremor of the hands, as well as from all other nervous complaints.

The foregoing facts serve to show that tobacco is one of the most active and deadly vegetable poisons known : it acts directly upon the nervous power, enfeebling, deranging, or extinguishing the actions of life. Is it possible that the *habitual* use of an article of so actively poisonous properties can promote health, or, indeed, fail to exert an injurious influence upon health? It will readily be admitted that the daily use of any article which causes an exhaustion of the nervous power beyond what is necessarily occasioned by unstimulating food or drink and the ordinary physical agents, is not only useless, but hurtful, tending directly to produce disease and premature decay.

From the *habitual use* of tobacco in either of its forms the following symptoms may arise : A sense of weakness or pain at the pit of the stomach, dizziness or pain in the head, disturbed sleep, starting from early slumbers with a sense of suffocation or the feeling of alarm, incubus or nightmare, weakness of the mental faculties—Dr. Rush mentions an instance of a man who at the age of forty lost the use of his memory entirely through the excessive use of snuff—peevishness of temper, long fits of melancholy and despondence, and in some cases *entire and permanent mental derangement.*

The animal machine, by regular and persevering reiteration or habit, is capable of accommodating itself to impressions made by poisonous substances so far as not to show signs of injury under a superficial observation, provided they are slight at first and gradually increased ; but it does not hence follow that such impressions are not hurtful. It is a great mistake, into which thousands are led, to suppose that every unfavorable effect or influence of an article of food or drink or luxury must be felt immediately after it is taken.

The vital principles of the human body can so far resist the influences of a variety of poisons slowly introduced into it that their effects shall be unobserved till, under the operation of an exciting cause, their accumulated force breaks out in the form of some fearful or incurable disease. The poison which comes from vegetable decompositions on extensive marshes and the borders of lakes, after being received into the body, remains apparently harmless, in some instances a whole year, before it kindles up a wasting intermittent or destructive bilious fever.

But though there be few things which can further excite our astonishment after a consideration of the first great error in the use of this plant, it cannot but be a source of wonderment to the uninitiated to learn that many resort to this most degrading custom through the idea that it is a MANLY habit—that sickening and defiling one's self and poisoning the surrounding atmosphere, to the injury of our neighbors, by means of sundry successive puffs or ejections of this narcotic, is a manly habit. By this misguiding reason hundreds of healthy youth have been induced against their better judgment to undergo the tediously sickening initiatory process, and, waking from the deluding dream of superior manhood, find themselves quite as low in the scale of existence, weighed down by a vice troublesome to themselves and afflictive to society around them. But listen to the tale of one of these desirers of a precocious manhood.

A gentleman relates that at the early age of fourteen, under the impression that it was a manly habit, he commenced chewing tobacco, and a long and painful course of training was required before the stomach could be brought to retain it. At length the natural aversion of this organ to the poison was so overcome that an exceedingly large quantity might be taken without producing nausea. For several years the patient continued its uninterrupted use, swallowing all the secretions of the mouth saturated with this baneful narcotic, without experiencing much disturbance of health. At length he began to be harassed with heart-burn, attended with copious eructations of an exceedingly acid fluid, together with other indications of dyspepsia.

A watery stomach was suspected, and smoking was at once

recommended in addition to chewing to alleviate the accumulation of water in the stomach and to assist digestion. Smoking was accordingly practised after every meal, with little alleviation of the difficulty. The patient, however, being determined to be benefited by its use, resorted to it more frequently, smoking not only after eating, but several times between meals. Yet, to his great surprise, his troublesome symptoms were gradually augmented, notwithstanding his strenuous adherence to the practice. To the heart-burn and acid eructations soon succeeded nausea, loss of appetite, a gnawing sensation in the stomach when empty, a sense of constriction in the throat, dryness in the mouth and jaws, thickness of the voice, paleness, languor, emaciation, lowness of spirits—in short, all the symptoms which characterize dyspepsia of the worst stamp. He was well-nigh unfitted for any business, and his very existence began to be miserably burdensome. At last, being advised to abandon the use of tobacco in all its forms, and being fully persuaded that he must either relinquish it voluntarily or that death would compel him to do it, he summoned all his resolution to the fearful exigency, and after a long and desperate struggle obtained the victory. All the inconvenience he experienced was a few sleepless nights and an incessant hankering after the accustomed influence of the tobacco. His health returned, and he relinquished the habit forever, under the full conviction that tobacco was the sole cause of his illness, and he firmly resolved never to make further use of it.

Dozens of similar and equally strong instances might be cited, but I spare your patience, and pass to further consideration of its pernicious effects upon the health. Says Dr. Rush: "The appetite for tobacco is wholly artificial. No person was ever born with a relish for it. Even in those persons who are much attached to it Nature frequently recovers her disrelish for it. It ceases to be agreeable in every *febrile* indisposition." This is so invariably true that a disrelish to it is often a sign of an approaching and a return of the appetite for it a sign of a departing fever. It impairs the appetite. Where it does not produce this effect it prevents the early and complete digestion of the food, and thereby induces distressing and incurable diseases not only of the stomach, but

of the whole body. This effect of tobacco is the result of the waste of the saliva in chewing and smoking, or of the tobacco insinuating itself into the stomach when used in chewing or snuffing. It produces many of those diseases which are supposed to be seated in the nerves. A physician in Connecticut has remarked that it has in several instances produced palsy and apoplexy.

In answer to these observations upon the morbid effects of tobacco, it has been said that it possesses many medicinal virtues. Grant it, and the facts which establish its utility in medicine furnish us with additional arguments against the *habitual* use of it. How feeble would be the effects of opium and bark upon the body if they constituted a part of the condiments of our daily food! But while its efficacy as a medicine is admitted, it must not be forgotten that it is clearly the inducing cause of diseases to those who are in the habit of using it. A dram of ardent spirits suspends for a while a vomiting and tremors of the hands, but who does not know that those complaints are the effects of the intemperate and habitual use of spirituous liquors.

The advocates for tobacco tell us that smoking and snuff relieve that uneasiness which succeeds a plentiful meal. Admit that the stimulus of the tobacco restores the system from the indirect weakness which is induced by intemperance in eating, but the relief which is thus obtained illy compensates for the waste of the saliva in smoking at a time when it is most wanted, or for a mixture of a portion of the tobacco with the aliment in the stomach by means of snuffing. But why should we cure one evil by producing another? Would it not be much better to obviate the necessity of using tobacco by always eating a moderate meal? Says an eminent surgeon: "The opinion that tobacco is necessary to promote digestion is altogether erroneous. If it be capable of soothing the uneasiness of the nerves of the stomach occurring after a meal, that very uneasiness has been caused by some error of the regimen, and may be removed by other means. If tobacco facilitates digestion, how comes it that, after laying aside the habitual use of it, most individuals experience an increase of appetite and of digestive energy and an accumulation of flesh?" It is sometimes urged that men occasionally

live to an advanced age who are habitual consumers of this article. True; and so do some men who habitually drink rum, and who occasionally get drunk; and does it thence follow that rum is harmless or promotes long life? All that either fact proves is that the poisonous influence is longer or more effectually resisted by some constitutions than by others. The man who can live long under the influence of tobacco would live longer without it. Again, it is sometimes urged that tobacco is a preservative from contagious diseases. Facts contradict this assertion. Mr. Howard, the philanthropist, informs us it had no effect in checking the plague. Whatever tends to weaken or depress the powers of the nervous system predisposes it to be operated upon by the causes of these diseases. In Havana in 1833, containing a stationary population of 120,000, cholera carried off in a few weeks, if we may credit the public journals, 16,000; and Dr. Abbot states that the average consumption of cigars was $10,000 worth per day. Surely this was a fair trial of its anti-contagion powers.

It has been further said that chewing and smoking assist the intellectual operations. So do wine and distilled spirits; but shall we on that account have recourse to those liquors when we wish to stimulate our thinking faculties? Says Dr. Rush, "Tea and coffee are to be preferred when we wish to stimulate the mind." Pope recommends a trotting-horse for the same purpose. But he continues sagely, "I suspect that tobacco is often used rather to *supply* the *want* of ideas than to *collect* or excite them." The absence of sensation, whether of external impressions upon the body or of reaction of the mind in thought, is always accompanied with misery. Hence the Indians spend whole days and even weeks in smoking, in order to relieve themselves from the anguish which attends the inactivity and vacuum of their minds. The opinion that the use of tobacco preserves the teeth is supported neither by physiology nor observation. Constantly applied to the interior of the mouth, whether in the form of cud or of smoke, this narcotic must tend to enfeeble the gums and the membrane covering the necks and roots of the teeth, and in this way must rather accelerate than retard their decay. It cuts away the gums, leaving the teeth standing up like stumps in the mouth. We accordingly find that tobacco consumers are

not favored with better teeth than others, and on the average they exhibit these organs in a less perfect state of preservation. Sailors make a free use of tobacco, and they have bad teeth. Rush mentions an instance of a man that lost all his teeth by drawing the hot smoke of tobacco into his mouth by means of a short pipe. The grinding surfaces of the teeth are, on the average, more rapidly worn down or absorbed from the chewing or smoking of tobacco for a series of years, being observed in some instances to project but a little way beyond the gums. This is frequently observed among the North American tribes of Indians. The teeth when the jaws are closed, more particularly where the cud has been kept, have been seen to be a tenth and even a sixth of an inch apart. Such are some of the injurious effects of this narcotic on the human system.

We proceed next to mention the influence of the habitual use of tobacco upon morals.

In the practice of smoking there is no small danger. It tends to produce a huskiness of the mouth, which calls for some liquid. This thirst cannot be allayed by water, for no sedative or even insipid liquor will be relished after the nerves of the mouth and throat, through exposure to the influence of the stimulus of smoke, have become in a half palsied state; hence, in order to be tasted, an article of a pungent or stimulating character is resorted to, and these strong drinks, when taken between meals, soon lead to intemperance and drunkenness; hence the kindred habits of smoking and drinking. A writer in one of the American periodicals, speaking of the effect of tobacco in his own case, says that "smoking and chewing produced a continual thirst for stimulating drinks, and this tormenting thirst led me into the habit of drinking ale, porter, brandy, and other kinds of spirit, even to the extent at times of partial intoxication." He adds that after he had subdued his appetite for tobacco he lost all desire for stimulating drinks.

The use of tobacco disposes to idleness, and idleness has been considered as the root of all evil. "An idle brain is the devil's workshop," says the celebrated Bunyan.

The habit of using tobacco is uncleanly. The neglect of cleanliness has ever been allowed to exert an injurious effect

upon the morals. Says Rush, "Tobacco when used in smoking is generally offensive to those people who do not use it." To smoke in company under such circumstances is a breach of good manners; now, manners have an influence upon the morals. They may be considered as the outposts of virtue. A habit of offending the senses of friends or strangers by the use of tobacco, therefore, cannot be indulged with innocence.

It produces a want of respect for our fellow-creatures, and this always disposes to unkind and unjust behavior toward them. Who ever knew a rude man completely or uniformly moral? In the infancy of their society the Methodists forbade the use of tobacco. The prohibition discovered a high and just sense of the self-denial, decency, and universal civility which are required by the Gospel. What reception may we suppose would the apostles have met with had they carried into the cities and houses to which they were sent snuff-boxes, pipes, cigars, and bundles of cut or rolls of pigtail tobacco? *These would have furnished solid arguments against their self-denying doctrines. The very idea is absurd.* This habit is uncleanly from the foul odor, the muddy nostril, and darkly smeared lip it confers, and from the encouragement it gives to the habit of spitting, which in our country would be sufficiently common and sufficiently loathsome without it. "True politeness," said a distinguished English scholar, "is kindness kindly expressed." The use of tobacco, especially by smoking, is anything but kindness or the kindly expression of it, when it creates an atmosphere which, whether it comes directly from the pipe, the cigar, or deeply imbued clothing, or worse than alligator breath, is absolutely insupportable to many who do not use it, causing depression of strength, dizziness, headache, sickness at the stomach, and sometimes vomiting. By what rule of politeness—nay, on what principle of common justice, may I poison the atmosphere my neighbor is compelled to breathe, or so load it with an unhealthy and loathsome material as to make him uncomfortable or wretched so long as I am in his company?

What would be said of the physician who, having acquired a strong liking for assafœtida, should allow himself the constant habit of chewing it, to the great annoyance, from his foul breath, of many of his patients, as well as more or less of

the healthy individuals of the families who employ him? Or how would a *gentleman* traveller be regarded who should not only keep his breath constantly imbued with this assafœtida, but also insist upon spurting successive mouthfuls of the tincture of it upon the floor of a stage-coach or the cabin of a steamboat? Would he be commended either for his cleanliness, politeness, or kindness? Nay, would he be tolerated in such a violation of the principles of good breeding? I have seen numbers who have been made sick, dizzy, and pale by the breath of a smoker; and I have seen a person vomit from a stage coach from the *influence* of that *indescribable* breath which results from alcoholic liquor and tobacco smoke.

We need not multiply instances to show the deleterious effects of its use on the physical or moral nature, the beastliness of the habit, or its utter unfitness to answer any of our wants, the rudeness of its general use, and the consequent deadening effects on all the more refined emotions of life. Nature has ordained by irreversible laws that such should be the effect of this plant upon our system; what excuse, therefore, can one present for a continued practice of so loathsome a habit? The human system furnishes one of the most complicated and delicate machines to the contemplation of which the mind of man was ever called. An equable excitement of all its parts, or, in other words, an equal distribution of the powers of life, constitutes the health and soundness of this wonderful machine, the frame of which is curiously and wonderfully made. If health, then, depends on the even and equable distribution of the powers of life, how imperiously are we forbidden to derange its condition by the application of such stimulants as will destroy the just equilibrium of the system.

We are assured by high authority that our bodies are not our own; let us take heed how we prostrate their energies. How can an advocate of temperance use tobacco? With what consistency can he ask his neighbor to abstain from alcohol, on the ground of its being injurious to body and mind, while he indulges himself in the habitual gratification of an appetite so unnatural and pernicious, holding in some respects so strong an alliance with that produced by an alcoholic beverage. Singular as it may seem, the clergy of

the preceding age were accustomed to hold their ministers' meetings with pipe in hand, and thus discuss the interests of their vocation amid the exhilarating fumes of this prime narcotic. But this race of worthies is passed away, and left other and better remembrances behind than those to which in their day custom gave its willing sanction. Let us reverence their virtues, but take heed how under their cover we copy their frailties. To this branch of the subject too much serious thought cannot be bestowed. In the words of a philanthropist and Christian, How long shall the widow's mite, consecrated under many personal privations to the great object of doing good to mankind, be perverted to sustain a disgustful and hurtful habit by the beneficiary of an education society?

How long are the sacred oracles of God to be polluted with this unhallowed offering and the garments of the priesthood to remain uncleansed from its defilements? How long shall transgressors be called upon to listen, with a spirit of conviction and repentance, to sermons on the great duties of Christian *self-denial* prepared and pronounced under the inspiration of this poison? But some very calmly inquire, *Why* was this plant created if *not for the use* of man? Let such reasoners reflect that there are many other pernicious plants in whose case they might hardly wish to apply the same argument.

For clearly by the same train of reasoning we may compel ourselves to eat the nux-vomica or drink prussic acid. But we are assured that nothing is created in vain, and though horses, cows, sheep, and hogs refuse it, and the moth is chased from our clothes by its odor, let us not arraign the wisdom and economy of nature in its production. Modern travellers have at last discovered that it constitutes the food of a solitary and filthy wild beast, well known in the deserts of Africa, called the rock goat.

To that solitary inhabitant of a Transatlantic desert let all rational beings resign their claim; let them *de*SERT entirely, at once and forever, a practice which makes man a monument of inconsistency and degradation, and all fetters broke, rejoice in their freedom to rush to that eminence only attainable by the *rigidly self-denying virtuous.*

W. THORNTON PARKER, A.M., M.D.

BOSTON, MASS.

QUACK MEDICINES.

MOTHER SEIGEL'S SYRUP, MRS. WINSLOW'S SOOTHING SYRUP, GODFREY'S CORDIAL, ETC.

"BUT for old Mother Seigel's Curative Syrup," writes a grateful patient, "the grass would now be growing over my grave." We ought not, perhaps, to doubt the genuineness of this poetical testimonial, for the gentleman who gives it "belongs to one of the oldest and most respected families in the beautiful village of ——, and his personal character is attested by the doctor of the parish, besides other excellent names." The testimonial purports to be a quotation from the "Editorial Columns of the Doncaster *Reporter*, July 6th, 1887." We learn that diseases of the liver, rheumatism, dyspepsia, sick headache, gravel, stone, and diseases of the skin are all successfully treated by the Curative Syrup.

For once in a way a benefactor to humanity comes out into light. We read that old Mother Seigel lived near Berlin. Her skin was "marvellously white and pure and smooth, and although sixty-five years of age, she told me she attributed the ivory-like and elastic whiteness of her skin to the occasional use of the syrup." What the "elastic whiteness" may mean we must confess we are at a loss to determine. Then, too, we are gravely informed that, "if there were anything in the least harmful in this medicine, enough has been sold of it in the last ten years to depopulate the kingdom, and it would long ago have been suppressed and driven out of the market." We must confess that we are far from being so sanguine. The medicine in question pays duty, it bears the Government stamp, and as long as this is the case there is not much chance of its suppression. Anyhow, it is a large source of revenue; and, after all, that appears to be the only consideration that troubles the powers that be.

We are told that Mother Seigel's Syrup is "a charming pick-me-up;" and in one sense this is not to be doubted. Finally, we read that:

"To protect the public from fraud, the Commissioners of Inland Revenue have consented to engrave the words 'A. J. White, Limited,' on all the stamps furnished to us."

Now for the secret. Aloes is the active principle in the form of the compound decoction, which is combined with borax; capsicum, gentian, oil of sassafras, oil of wintergreen, and treacle, to flavor it; dandelion, and rectified spirit. Now we understand the "charming pick-me-up." Aloes, borax, and dandelion in the charming pick-me-up. We know from the little book what these common drugs will cure when thus combined. What valuable drugs aloes, borax, and dandelion must be! or does the virtue lie in the "charming pick-me-up"? But, then, if it had not been for "Old Mother Seigel's Curative Syrup" "the grass would have been growing over the grave" of the poor lawyer's clerk, the "young man who belongs to one of the oldest and most respected families in the beautiful village of," etc. Many are the touching stories of wives' devotion; but there is one heroine worthy of remembrance by all grateful husbands. We mean the woman who sold her sick husband's trousers and bought the bottle of "Mother Seigel's Syrup" with the proceeds. Needless to add that the bottle containing aloes, borax, dandelion, and the "charming pick-me-up" saved his life.

Bacon, in his "Advancement of Learning," says: "Nay, we see the weakness and credulity of men is such, as they will often prefer a mountebank or witch before a learned physician." Old Mother Seigel with her "skin of elastic whiteness" would have stood a poor chance, we fear, with Sir Rupert Murgatroyd, who, we know, employed his leisure in the persecution of witches. There is no middle course. We must either accept the *vis medicatrix naturæ* or Mother Seigel, knowing, as we do, the composition of her syrup.

MRS. WINSLOW'S SOOTHING SYRUP, ETC.—At page 202 of Murrell's Poisons we find the following: "*The preparations sold under this name* (Soothing Syrup) *usually contain opium. Said to be the cause of death of* 150,000 *children every year.*"

MRS. WINSLOW'S SOOTHING SYRUP, the same author tells us, contains "Morphia with essence of anise and syrup of balsam of tolu." It may be said that opium and its compounds act as a poison upon young infants. But Mrs. Wins-

low's Soothing Syrup, Mother's Friend, Black Drop, Godfrey's Elixir, Dalby's Carminative, and their like, are habitually given to young infants in this country—not as medicines, but simply as stupefacients. Dr. Murrell, speaking of *Godfrey's Cordial*, states "that it is said to be a mixture of treacle, sassafras, and laudanum." It contains half a grain of opium in the ounce. In five years fifty-six deaths from this compound were recorded. "The fatal dose for an infant is about a teaspoonful."

NEPENTHE "is said to consist of purified extract of opium, citrate of morphia, and grape-sugar mixed with sherry. It is probably about the same medicinal strength as laudanum."

MOTHER'S FRIEND.—"This is a soothing syrup extensively used in some parts of the country. It is eminently adapted for increasing the infant mortality of the neighborhood. Eight or ten drops usually answers the purpose, the child dying speedily with all the symptoms of opium-poisoning. The jury generally return a verdict of Accidental Death, and mildly censure the chemist or patent-medicine vendor from whom it was bought."

DALBY'S CARMINATIVE is composed (according to high authority) of carbonate of magnesia, oil of peppermint, anise and nutmeg to flavor, *laudanum*, tincture of assafœtida and spirit of pennyroyal, tincture of castor and compound tincture of castor, and peppermint water. *Death has been caused from forty drops given to an infant.*

BLACK DROP is "an old-fashioned preparation of opium, said to be *three or four times as strong as laudanum.*"

BATTLEY'S SOLUTION (generally only used by medical men) is fifty per cent stronger than *laudanum.*

These preparations (except the last) are freely advertised to "mothers robbed of their rest." Their extensive use results in a vast infantile mortality. Dr. Thomas Stevenson states that "there is no doubt that great numbers of infants perish every year in this country through the improper use of quack remedies containing opium."

Dr. Hubbard concludes his article on "Patent Medicines" with this complaint: "The nature of articles to which Government stamps are affixed have, or at least presumably have, the cognizance and sanction of the Legislature. Many of

these medicines, though composed of the most potent poisons of the Pharmacopœia, are sold indiscriminately to the public from grocery and provision stores. *They are constantly proving pitfalls to robust adults as well as to tender infants.*" This fact cannot be too strongly impressed upon the minds of our legislators.

These things are poisons. They should be sold as such, and not as quack, or proprietary, medicines, but labelled for what they are, and their use, save under medical advice, prohibited.

Even mediæval governments did not permit the sale of "Aqua Tofana," and the good old lady, its inventor, had a rough time of it. Poisoning used to be petty treason in England, and was punished by boiling to death. The Pharmacy act of 1868 was a step in the right direction; but "when," to quote Dr. Hubbard, "deaths ensue as a consequence of overdoses of *those secret compounds and mysterious mixtures of drugs, the potency and dangerous nature of many* of which are well known, and *only* known, to the proprietors and compounders of them, and which are advertised, not in their technical names, but under *fictitious* designations, such deaths can hardly come within the definition of 'circumspection' and 'moderation,' nor, I submit, can they justly be the subject of such facile verdicts as 'misadventures' or excusable homicides."

We read in the proceedings of the House of Commons some years ago that "Mr. Warton called attention to the subject of patent medicines, and urged the desirability of placing restrictions on the sale of patent medicines of a poisonous character. He maintained that the Government stamp affixed to patent medicines was often taken by ignorant people as a Government guarantee of the so-called specifics. It was a curious thing that by the Act of Parliament *the rights of quacks were reserved;* for by the Pharmacy act patent medicines were exempted from the provisions in respect to poisons. There were, however, many cases in which chloral and other things of the sort had proved fatal. He suggested that the Government stamp should set forth that the duty was levied for fiscal purposes, but was not to be taken as a guarantee of the contents. Dr. Farquharson thought the honorable mem-

ber for Bridport had done good service in bringing the question forward, and agreed with him that some mode should be adopted for preventing the Government stamp being accepted as a guarantee of the medicines. Mr. Hibbert agreed that the question was an important one, and sympathized fully with the honorable member for Bridport. *He could not promise anything on behalf of the Government; but he hoped that they would consider the question, and introduce a better system than that which obtained at present.*" Are they still considering the question? Is it not time that the "better system" were introduced? Or are the infants to go on dying, and the juries to continue to return verdicts of misadventure? This is a matter that should be decided with the least possible delay. The present state of affairs is absolutely scandalous.—*The Saturday Review.*

HEALTH BOARD ORGANIZATIONS; THE IMPORTANCE OF STANDING COMMITTEES ON HYGIENE OF THE COUNTY MEDICAL SOCIETIES; THE CONTINUED MENACING ATTITUDE OF CHOLERA.

STABLE NUISANCES, ILLEGAL SALE OF IMPURE AND UNWHOLESOME MILK, AND CANNED GREEN PEAS IN THE CITY OF NEW YORK.

REPORT OF THE COMMITTEE ON HYGIENE OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

To the Medical Society of the State of New York:

YOUR Committee on Hygiene report for the year 1887 that its field of observation during the year has been chiefly with regard to organization of local Boards of Health. One of the efforts of this committee has been to secure the formation, in each county society, of a standing committee on hygiene, in the belief that this would serve as a direct source of communication between this committee and the profession at large. In its work, scattered over so large and populous an area as the State of New York, we find much difficulty in securing general co-operation with any scheme of work, on account of those breaks in communication between the county societies

and this committee. This compels dependence largely upon individual effort, and renders the labor in any line of investigation extreme, on account of a lack of division.

We would accordingly urge the necessity of securing such a committee, as a part of the organization of every county society, and so constituted as to prove efficient, by special fitness of its members, for such work; and, further, that the committee consist of not more than five or less than three members.

At the last annual meeting of this society the subject of the efficiency of the Boards of Health throughout the State, under the present laws, was referred to this committee for report at this meeting. It will be recollected that the late president of this society, Dr. Ely, addressed a circular of inquiry to a large number of the members of the profession and others in this State upon this subject. To this an extended series of replies was received. A careful examination and analysis of these shows that there are some failures generally apparent, chiefly in the matter of efficiency. It is the observation of this committee, in common with others, that the twelve hundred Boards of Health in this State, constituted under the existing laws, work satisfactorily in many respects. Yet some marked evils are recognized, the existence of which correspondingly interferes with the usefulness and efficiency of the Boards of Health.

These evils lie largely in the province of politics. They appear, first, in the composition of the board itself, and, secondly, in the position of health officer. Political and sanitary interests are rarely identical, and hence a sacrifice of the latter to the former is the usual result.

It occurs to us to suggest the wisdom of reducing the maximum number of commissioners to five, leaving the minimum, as at present, three, since we believe that the lesser number would insure more individual interest and responsibility, as well as lessen purely political considerations.

The appointing power is one of the most difficult questions to meet satisfactorily. In cities, it seems that the matter could be much better settled by placing the appointing power in the hands of the mayor, and holding him entirely responsible for the character and conduct of appointees.

The provision, in cities, for nomination by the mayor and confirmation by the Common Council divides responsibility and strengthens political influence in controlling the board. In towns and villages, the desired results might be reached by placing the appointment of members of the board in the hands of the president of the village, or supervisors of the county, and limiting the number to three.

The position of the health officer, under the present law, is not entirely satisfactory. His relation to the board, in cities, is that of an employé, in that he is elected by the board and has a salary fixed by the Common Council. He is thus lacking in that independence which is considered vital to complete success in the work of the board. Gaining his position by political influence in a large number of instances, he is more or less completely under political control. Liability to displacement with every change in the political complexion of the board, together with the inadequate salary usually paid, cause failure in securing those who would fill the position to the greatest advantage. It seems that the *appointment* of the health officer instead of his *election*, and by the same power as the commissioners are appointed, together with a prospect of continuance in office if capable, would better secure efficiency.

The attention of your committee has also been called to the expression of sentiment, in some localities, by the profession that the members of the various Boards of Health should *all* be physicians. We would very decidedly dissent from such a proposition, believing that, in a board of three members, one physician is sufficient, and in one constituted of five or seven members, two at most are sufficient. The other members of the board should be persons of intelligence in sanitary matters and of business capacity.

While the failures noted are apparent, we find it difficult to suggest detailed plans for immediate change. We would, however, emphasize the importance of a movement by this society in the direction of fixing responsibility more directly in the appointment of the members of the Health Boards of the State, and of changing the status and relations of the health officer so as to insure greater independence, ability, and efficiency.

Cholera continues to maintain a menacing attitude, and is

more than ever a source of anxiety since the recent exposure of the decayed and unequipped condition of the New York Quarantine establishment. Its mere suspension of activity on the setting in of cold weather among communities in constant commercial intercourse with, and from which thousands of immigrants are constantly on the move to New York, should admonish the health authorities throughout the State and nation that no means should be spared by which it may be deprived of a foothold, should it, unfortunately, escape quarantine. Moreover, it should be borne in mind that the danger of introducing fomites—clothing, and certain articles of merchandise subject to infection—is even greater during the period of suspended activity of the disease than at any other time. While, therefore, it is earnestly hoped that the New York Quarantine establishment may be thoroughly repaired and equipped as soon as possible, the duty is more than ever incumbent upon health authorities everywhere to exercise the utmost vigilance with regard to the effects of recently-arrived immigrants, as well as preventive measures against any sustaining conditions, even though such effects should be introduced.

The report of the Committee on Hygiene of the Medical Society of the County of New York is as follows :

Among the matters which have come under the consideration of the committee are some to the present aspects of which it seems proper to ask the special attention of the society.

I. *The prevention of nuisances from stables* in New York is an object to which many efforts of the committees of previous years have been directed. In view of its importance it is desirable that the provisions of the law respecting it, as recently amended, and as stated in the Sanitary Code of the Board of Health, dated September, 1887, should be generally known. Among them are the following (section 100) :

All stables, and the drainage, yards, and appurtenances thereof, " shall at all times be kept in a cleanly and wholesome condition." When they are situated within three hundred feet of any dwelling-house or any manufactory in which more than five persons are employed, " the removals from the

stable shall not be made, nor shall the manure or refuse from the stable be allowed to remain on any street or place near such stable any time between 8 o'clock A.M. and 11 o'clock P.M. without a permit from the Board of Health."

"Whenever there shall be a cart-load of manure upon any premises it shall be immediately removed, unless it be pressed or baled."

"No manure-vault under the sidewalk shall be built or used."

It thus appears that the law as it now stands is adequate, if it be enforced, to prevent or to abate nuisances arising from stables, and the remedy when such nuisance exists, or when any manure-vault under the sidewalk is kept in use, is, for any person who may suffer therefrom in his health, comfort, or property to report the fact to the Board of Health, whose duty it is, and whose powers are ample to enforce the law.

The too-familiar nuisance of carts loaded with manure or other disgusting material only partially covered, and scattering their contents along the street, is prohibited in section 107, which requires that all carts, vehicles, boxes, tubs, or receptacles which shall be used for conveying such materials, "shall be strong and tight, and the sides shall be so high above the load or contents that no part of such load or contents shall fall, leak, or spill therefrom, and either the vehicle or the vessel carried by it shall be so covered as to be inoffensive."

Inasmuch as the removal of offensive materials can only be done under permits from the Board of Health, it would seem to be especially the duty of that body to prevent the violation of this law.

II. *The illegal sale of impure and unwholesome milk* is doubtless carried on to a great extent in this city. As milk is especially the food of infants, of children, and of the sick, and is more easily adulterated than any other article of food, the importance of suppressing this evil can hardly be exaggerated. The efforts of the Board of Health to abate it have been praiseworthy, but the force which has hitherto been employed in milk inspection is entirely inadequate. This is shown by the fact that milk is retailed in five thousand stores in this city, and there are but four milk inspectors. But were the number of these inspectors doubled or even quadrupled, it is

probable that the suppression of the evil would still be impossible under existing laws, since the temptation to dishonesty and the facilities for it are so great. The simplest and most efficient means of accomplishing it would probably be to require that no person shall sell milk in this city except under a license from the Board of Health, which license shall be revocable in case of repeated or persistent violation of the law. Unscrupulous vendors could thus be weeded out of the business to the advantage of honest dealers, and the still greater advantage of the public. That this system has not already been adopted by the Board of Health is due to the fact that its right to do so has been pronounced by its legal adviser as questionable under existing laws. If that is the case, legislation conferring upon it the requisite power seems to be urgently needed.

Nursing Bottles.—One further topic has been considered by the committee—viz., whether any means could be taken to prevent the use among bottle-fed children of the nursing bottles with long tubes of rubber and glass reaching to the bottom of the bottle. In spite of the fact that their use has always been discouraged by the profession, and that they are condemned in all text-books as being dangerous, they are widely sold in all the shops, and continue to be widely used among the poorer classes. In one of the large dispensaries of the city, where many children are treated, fully two thirds of those brought with bottles were using this variety. An observation made last summer of the sick children on one of the excursions of the Floating Hospital of St. John's Guild, showed that almost every bottle-fed child on the boat was nursing one of these bottles.

The evil is so great and so well known that it needs only to be mentioned by your committee.

It would respectfully recommend that the attention of the State Society at its coming meeting be drawn to this matter, in order that some steps may be taken to secure appropriate legislation upon this subject.

The question of the constitutionality of such a measure, if passed, rests upon whether it can be shown very clearly that such nursing bottles are injurious to public health. This is the opinion of the counsel of the County Medical Society.

The only points referred to are the following :

1. The enormous mortality among bottle-fed children in tenement-house districts.

2. One of the most important, if not the most important factor in this mortality is the use of food improper, uncleanly, and, most of all, *milk* in which the changes of decomposition have begun.

3. One of the chief obstacles to pure food is dirty bottles and vessels, especially those containing particles of sour milk.

4. The tube bottles are so constructed that cleanliness is a matter of impossibility by any of the means ordinarily employed, even by the use of brushes.

5. The shopkeepers assert that many of the very poor do not buy the brushes at all, to save additional expense.

To what extent are these used? Inquiries have been made at nineteen drug-stores to inquire of their sales. Four stores in tenement districts sell, on an average, eight times as many as without any tubes. Five stores in good localities sell, on an average, six times as many of the other variety.

III. *Canned Green Peas.*—A resolution adopted by the State Board of Health, and made a law by the approval of the Governor on December 2d, 1886, permits the sale of canned green peas colored with copper in quantity not exceeding the equivalent of three grains of crystallized sulphate of copper to each pound, provided that the amount of such addition is legibly marked on the outside of the can. Under this law canned green peas colored with copper and imported from France have been quite extensively sold by reputable grocers, but without the required inscription on the can.

The sale of vegetables thus colored has been condemned by high medical authorities in France, Germany, Belgium, and England as likely to be injurious to health, and is prohibited by the laws of those countries.

The law of this State, above referred to, therefore permits the importation from France, and the sale here, of adulterated articles of food, which are liable to be deleterious to health, and which are not permitted to be sold in that or in other civilized countries. Such a singular anomaly in sanitary legislation would seem to be an appropriate topic for reconsideration by the State Board of Health.

NEW YORK, December 19, 1887.

Walter De F. Day, M.D., Sanitary Superintendent Health Department of the City of New York:

SIR: I have the honor to report the result of the examination of samples of *canned green peas.*

Eleven samples of canned peas were purchased, as follows:

No. of Sample.	Brand.	Name and Address.
5033	J. Meyer & Co., Balt., Md., Maryland Brand	Park & Tilford, 122 6th Ave.
5034	Daudicolle & Gaudin, Bordeaux	Park & Tilford, 122 6th Ave.
5035	J. Meyer & Co., Balt., Md., Maryland Brand	Park & Tilford, 122 6th Ave.
5040	Extra Marrowfat Peas	Wm. H. Cohen & Co., 229 Washington St.
5041	Golden Rod	Kemp, Day & Co., 100 Murray St.
5042	Early June Peas, T. F. Meyer & Co., Balt., Md	John Romaine, 101 Warren St.
5060	J. Novialle, Bordeaux	— Stivers, Vesey & Washington Sts.
5061	Rollaud au Maus	Callahan & Kemp, 41 Vesey St.
5062	Daudicolle & Gaudin, Bordeaux	Acker & Merrill, Chambers St. and West Broadway.
5063	Eug. Mercier, Paris	Acker & Merrill, Chambers St. and West Broadway.
5064	Duprat, Clement & Mauvel, Bordeaux.	Acker & Merrill, Chambers St. and West Broadway.

These samples were analyzed for copper, with the following results:

No. of Sample.	Weight of Peas Contained in Can. Oz.	Metallic Copper. Grains.	Equiv. to Crystallized Copper Sulphate. ($Cu.SO_4.5H_2O$).	Metallic Copper. Parts per Million.	Remarks.
5033	12.7	Trace	Trace	Trace	Inside of can corroded.
5034	10.1	0.511	2.010	115.8	Peas contained in glass jar.
5035	13.0	Trace	Trace	Trace	Inside of can corroded.
5040	13.5	Trace	Trace	Trace	....
5041	14.0	Trace	Trace	Trace	....
5042	12.5	Trace	Trace	Trace	....
5060	9.0	0.264	1.039	66.9	Inside of can corroded.
5061	9.8	Trace	Trace	Trace	Inside of can corroded.
5062	9.2	0.428	1.684	106.3	Inside of can corroded.
5063	11.1	0.468	1.841	96.5	Inside of can corroded.
5064	9.8	0.566	2.227	132.4	....

DOMESTIC BRANDS DO NOT CONTAIN COPPER.

I would respectfully call your attention to the fact that the domestic brands contain only traces of copper, while the

FOREIGN BRANDS CONTAIN COPPER.

Foreign brands contain appreciable amounts, as shown in the above table.

NOT LABELLED AS CONTAINING COPPER.

None of the brands were stamped, marked, or labelled in such a manner as to indicate that they contained added copper or its salts.

NEW YORK STATE LAW.

The State Board of Health in 1886 passed a resolution which, being approved by the Governor, became a law on December 2d, 1886. This law permitted the addition of not more than the copper equivalent to three grains of crystallized sulphate of copper ($Cu\,SO_4.5H_2O$) per pound, provided that the amount of such addition be legibly marked on the outside of the can.

Belgian Law.—In Belgium, the result of a discussion before the Belgian Medical Academy in 1886, in answer to the letter of the Minister of the Interior, dated November 17th, 1885, was as follows:

"The addition of copper is not only useless; it is harmful."

French Law.—In France, a decree of the Minister of Agriculture, dated December 20th, 1860, reads:

"It is forbidden for manufacturers and dealers to use vessels or salts of copper in the preparation of preserved fruits or vegetables destined for foods."

Opinion of "Comité Consultatif."—The "Receuil des travaux du Comité Consultatif," 1883, Vol. II., p. 271, reads: "In the present state of the science, it is not demonstrated that the greening of preserved foods with copper salts is absolutely harmless. There is therefore no occasion for removing the prohibition."

German Law.—In Germany, an ordinance of May 1st, 1882, reads:

"Poisonous colors, for the preparation of foods and drinks which are designed for sale, shall not be used. Poisonous colors in the sense of this ordinance are all those coloring materials and preparations which contain antimony, arsenic, barium (excepting barium sulphate), lead, chromium (excepting pure chromic oxide), cadmium, *copper*, mercury (excepting cinnabar), zinc, tin, gamboge, and picric acid."

English Law.—In England, the "Sale of Food and Drugs Act" of December 3d, 1875, reads:

"No person shall mix, color, stain, or powder . . . any article of food with any ingredient or material so as to render the article injurious to health." . . .

Legal Case under English Law.—A legal case under this act was as follows:

In 1877, the health officers of London summoned a dealer before the court "for selling French peas which were adulterated with copper, and, consequently, injurious to health."

Opinions of Scientists.

Dr. Evans, Dr. Pavy, Dr. William Guy, and Dr. Charles Tidy agreed that the amount of copper found in the peas—namely, 0.56 grain per pound, if taken repeatedly, would be injurious to health.

Decision of the Judge.—Mr. Knox, the judge, "after cautioning the defendant, and expressing the wish that publicity might be given to the fact that persons would not be permitted to bring to this country goods deleterious to the health of the inhabitants . . . imposed a fine of £5 6*s.*"

Professor Waller's Report.—I would respectfully refer you to the report of Professor Elwyn Waller, tansmitted to the board on , in which many valuable facts relating to copper in foods are set forth, including determinations of the amounts of copper in some of the same brands as those of which the analysis is given in this report.

Opinion of the Chemist.—In conclusion, I would state that in my opinion the use of copper in food products is neither desirable nor necessary, and that such use should be prohibited.

EDWARD W. MARTIN, *Chemist.*

A. HADDEN, M.D., C. EDSON, M.D., JNO. C. PETERS, M.D., D. B. ST. JOHN ROOSA, M.D., J. H. BILLINGS, M.D.:

Committee on Hygiene, New York County Medical Society.

In conclusion, we would express satisfaction in the improvement in sanitary conditions in many parts of the State, and we believe that these would be much extended by the organization of a special committee on hygiene in each county.

Respectfully submitted,

E. V. STODDARD, M.D.,
EDWARD F. BRUSH, M.D.,
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J. P. CREVELLING, M.D.,
Committee.

ALBANY, February 8, 1888.

THE SIGNIFICANCE OF A SANITARY ANALYSIS OF WATER.

By HENRY CARMICHAEL, PH.D.

To understand what importance, if any, is to be attached to a chemical analysis of water, it is necessary to briefly survey the history of the latter from the time it rises as vapor, under the influence of solar rays, from the bosom of the great ocean, until, descending upon the continent as rain, it returns to its source, again to be distilled in endless repetition.

The invisible vapor carried by air-currents inland, at its first precipitation as cloud, commences to absorb the solid and gaseous impurities of the atmosphere; and long before the rain-drops reach the earth, they receive appreciable quantities of ammonia, ammonium nitrite, carbonic acid, floating mineral and organic matter, as well as the germs of microscopic animal and vegetable life. To speak accurately, not a drop of water can be found in the natural world which is pure. Fortunately, the substances washed from the air are, with rare exceptions, innocuous. Some of them are indispensable to the life of the globe. Of first importance are ammonia and other nitrogen compounds. Although nitrogen forms four fifths by bulk of

the atmosphere, so inert and apathetic is it in its chemical relations that it is only with extreme difficulty that we are able to force it into combination with other elements. Nitrogen in combination is an essential constituent of proteid matter, with which life in both animals and plants is more immediately associated. Animals derive combined nitrogen from plants; plants derive it from the minute traces contained in the air. The combined nitrogen in the air, it is supposed, is generated by a mysteriously active form of oxygen called ozone. So parsimonious is nature in its supply of this indispensable plant-food, that, while millions of tons of free nitrogen cover the fields, to eke out the supply of combined nitrogen brought down by the rain, the latter form of nitrogen, under one name or another, must be bought by the thrifty agriculturist at about fifteen cents per pound. It brings us now near to our subject, as will be seen below, to observe that the combined nitrogen scantily present in rain-water is accumulated in plants, and in a still greater degree in the animals which feed upon them, and is found in the excreta of the latter, without much loss, in great abundance.

Animal waste is rich in nitrogen, and any considerable accumulation of combined nitrogen in nature is the product of animal waste.

An analysis of sewage or of water contaminated by it should reveal, therefore, an excess of combined nitrogen.

Rain-water on its way to the sea may flow over the surface of the ground, conveying, in suspension and solution, both organic and mineral matter to the nearest river, or it may slowly percolate through earth; and during its long sojourn, aided by the solvent power of carbonic acid, receive in richer proportion than in the other case mineral matter. As a general rule, river-water is soft, but abounds in organic matter. Spring-water is hard, and if its gathering ground is at a distance from the habitations of men, it is nearly free from organic matter.

Well, spring, and river waters commonly contain carbonates, sulphates, and chlorides of such bases as calcium, magnesium, iron, potassium, and sodium.

So far we have encountered no contamination injurious to life or health in this enumeration; and, going farther, we assert that *there is no proof that human or other filth largely*

diluted in water-supplies is of itself in the slightest degree unwholesome. In some instances this sewage contamination promotes the growth in still waters of minute forms of life which under the microscope appear quite alarming; but the history of most of them is as well understood as that of the cabbage, and their physiological action, when absorbed into the system, even less momentous. If any one is too fastidious to permit these interesting creatures to "play tag" in his stomach, it is only needful that the water be boiled and filtered. After this survey, it is time to admit that, beyond the identification of lead, arsenic, and a few other toxic substances that do not generally come within the scope of a sanitary water analysis, *chemistry alone is to-day incapable of declaring whether a given water-supply is or is not injurious to life.*

Of what use, then, is water analysis for sanitary purposes? We reply, much, through the indirect connection that exists between the organic matter found and the organized matter which, though unseen, produces disease.

Unfortunately, it not unfrequently happens that a large or small community is smitten with that terrible scourge, the typhoid-fever, which without difficulty is proved to have originated in the water-supply.

Chemical analysis reveals no unusual constituent; still, the water is deadly. This is not the place to recite the argument, but authorities agree that the only rational explanation of the phenomenon is the germ theory.

The germ is a minute plant which grows at the expense of its host, and then escapes to fasten upon other victims.

The excreta from some previous sufferer have been carelessly disposed of, and from vault or cesspool found the way, over or below ground, to the well or river which supplies the community. After the usual period of incubation, under favoring conditions it vastly multiplies, and asserts itself by a reproduction of the fever.

It might then appear that the examination of drinking-water should be relegated to the biologist, and conducted by means of a microscope rather than a test-tube; but the mistakes made by the great apostles of microscope cultures, Koch and Pasteur, prove that such a method is as yet too delicate to be practicable.

The object of a chemical analysis is to point out the danger, not which exists, but which possibly exists, whenever drains or cesspools communicate directly or indirectly with well or stream. Drinking-water should be beyond reproach ; and as the germs of zymotic or filth diseases naturally would travel by the same routes as the waste water of dwellings, it is sufficient usually to prove the safety of any given water by proving chemically the absence of those materials which are not, indeed, peculiar to sewage, but which exist there in the greatest abundance. The chemist determines for this purpose the amount of free ammonia which exists in rain-water, as we have seen, but only to the extent of about 0.24 parts in one million, and which in much larger quantities indicates the recent addition of putrid animal matter. Again : there is determined the organic nitrogen or "albuminoid" ammonia, which should not exceed, under ordinary circumstances, 0.2 parts, and in large amounts proves direct pollution.

As the sewage is eventually exposed to oxidation, it may lose all of the ammonia and albuminoid ammonia ; but the results of analysis still dislcose them as nitrates or nitrites. These may in turn be destroyed ; but there will still remain, as an indestructible indicator of previous contamination, an inordinate quantity of chlorine from the salt consumed by man. In most cases the soil contributes only traces of chlorine. In some instances the total solid matter and the total organic matter suggest important conclusions.

It does not appear that a water-supply is freed wholly from malignant germs by filtration or aeration ; and so long as evidence of animal contamination continues, it remains under suspicion.

Having made all possible tests in the laboratory, the chemist's opinion as to the relative safety of different samples presented may be as wide of the truth as a clairvoyant's, unless he is permitted personally to inspect their sources or otherwise to know their history.

A proper interpretation is still a difficult matter, and a greater certainty by the microscopic identification of germs in ordinary water examinations is greatly to be desired.—*Popular Science News.*

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.*

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

V. *Drainage.*—The ancients, both Greek and Roman, give medallic evidence of having recognized the importance of preventing and eradicating disease by removing not merely superficial and stagnant but subsoil collections of water. The following are instances:

A. SICILY.

(*a*) *Selinus* (a Greek colony).

Both tetradrachms and didrachms. Silver.

282. Obverse. The river-god of the Hypsus, one of the two streams of the place, as evidenced by the inscription, sacrificing at the altar of Æsculapius. Upon the didrachm a wading bird, symbolic of a marsh, is seen in the rear, as if departing. Sometimes the cock of Æsculapius stands beside the altar (Wm. Smith, Dict. of Gr. and Roman Geography, ii., p. 959). Reverse. A two-horse chariot, in which Apollo drawing his bow, while Artemis drives; the intent of this device also being anti-pestilential. One of the tetradrachms has upon its reverse Hercules with the Cretan bull.

Jouvenot Cat., Paris, 1873, no. 14.

283. Similar to the preceding, save that the inscription indicates the river Selinus, from which the colony was named.

Tetradrachm, in the Lee Collection.

Empedocles is said by Diogenes Laertius to have suggested the plan by which these marshes were drained and the city freed from epidemic disease.

B. ROME.

284. Obverse. Bust of the Emperor Hadrian. Reverse. A farm laborer standing upon a pump, whose top he holds;

* Continued from Vol. XIX., page 316.

in his left hand an inverted rake, and at his feet to the left two ears of wheat. Inscription: Tellus Stabil. Both gold and silver.

Vaillant, "Numismata Imperatorum Romanorum," 1696, p. 155.

285. Obverse similar. Reverse. A recumbent female supports with her right hand a globe upon her knee. Inscription as in preceding. Silver.

Ibid., p. 155.

Both of the above commemorate the draining of Lake Fucinus by Hadrian.

There are a great many ancient medals, alike Roman and Grecian, bearing recumbent river-gods with flowing urns. A portion of them commemorate battles and other events in the vicinity of these streams, the founding of cities, etc., the emblem being employed merely geographically. Others, I am convinced, have reference to engineering operations, more or less directly undertaken for ends affecting the public health. This is a question of much historical interest, which does not seem as yet to have been investigated.

In modern times there are a number of medals descriptive of extensive drainage undertakings. Among them are to be included those of canals, for though the primary objects of these may be intercommunication and transportation, they are, when properly planned and constructed, of very great service for land drainage. The same is true of drainage primarily undertaken for agricultural purposes in swampy regions and morasses. There are, upon the other hand, medals of irrigation also, which would not be out of place here, in view of the relation of such measures to public sanitation.

There have been two or three writers upon these subjects who have been medallists.

A. The United States.

Dr. Henry I. Bowditch, of Boston. "Topographical Distribution and Local Origin of Consumption in Massachusetts (Law of Soil Moisture and Land Drainage, and their Influence on Consumption)." Read at Annual Meeting of Massachusetts Medical Society, May 28, 1862. "Consumption in New England; or, Locality one of its Chief Causes,"

Boston, 1862, 8°. "Consumption in New England and Elsewhere; or, Soil Moisture one of its Chief Causes," Boston, 1868, 8°.

Dr. Bowditch has already been mentioned in Section I., and will be again referred to in Sections VIII., Diet; X., Epidemics; XI., Military and Naval Hygiene; and XII., Climate.

B. Belgium.

Charles Rogier, Minister of the Interior.

Two of the Rogier medals have already been described under Section I. (nos. 59, 60). A third belongs in this connection.

286. Obverse. Bust to right. Beneath, Léopold Wiener F. Inscription: Charles Rogier Ministre De L'Intérieur. Reverse. A young female, erect, holding in right hand a crown, and in left a cornucopia. At her feet a ploughshare, crowned. Inscription: Au Promoteur De La Science Agricole La Société D'Agriculture D'Alost. At sides, Enseignement. Drainage. Comices. Congrès. Exergue: 1858. Léopold Wiener. Bronze. 42.

Kluyskens, ii., p. 384.

In addition to the medals of Rogier unconnected with sanitation which have previously been mentioned as given by Guioth, there has recently been described by Alphonse de Witte, the accomplished librarian of the Royal Numismatic Society of Belgium, a mortuary Rogier medal, which he has also figured ("Médailles Historiques du Règne de Leopold II." [by De Witte, 1885], p. 161, No. 80, pl. LXVI).

J. H. Van Swinden.

C. Holland.

This sanitarian has already been mentioned under Sections I., General, and II., Water Supply. He is to be recalled in the present connection from having been a member of the Waterstaat, or Public Water Service, including the care of the dykes and regulation of the courses of the rivers of Holland (Kluyskens, ii., p. 557). He will again be referred to in Sections VI., Sewerage; X., Epidemics; and XIII., Registration.

In Section II., Water Supply, No. 101, I described the jeton

of Fréderic de Marselaere, who was Superintendent of Canals at Brussels in 1639. There are others of similar officials, as of

287. Engelbert Raverschott, Inspector of the same in 1634.

Neumann, No. 35,157.

This is distinct from the Raverschott jeton I have previously described, No. 155.

288. Hieronymus van Quesnoy, holding the same office in 1638.

Van Loon, ii., pp. 231, 237.

Neumann, No. 35,156.

289. B. de Laurette, Superintendent of do. in 1639, the same year with Marselaere.

Ibid., No. 351,009.

290. Adrian van Bansele, Inspector in 1642.

Ibid., No. 35,008.

291. Leonhart van der Noot, Inspector in 1649.

Ibid., Nos. 35,134–39.

292. Johan van den Heke, Superintendent in 1650.

Ibid., No. 35,095.

293. Jacob Philip van Dongelberg, do. in 1660.

Ibid., No. 35,070.

294. Theodor van Elshout, Inspector in 1671.

Ibid., No. 35,073.

295. Ferdinand de Victor, Superintendent in 1675.

Ibid., No. 35,193.

D. France.

Viscount Ferdinand De Lesseps (1805–), Constructor of the Suez Canal.

296. F. De Lesseps. 1869. A. Restelli. Tin. 50 mill.

Bom & Zoon Cat., Amsterdam, 1884, No. 4322.

297. 1885. By Ringel. Bronze.

Issued by J. Ronam, 29 Cité D'Antin, Paris.

See also nos. 341–45, Suez Canal.

Jean Rodolphe Perronet (1708–94), Director of the School "des Ponts et Chaussées" at Paris; Constructor of the Canal of Bourgogne.

298. Obverse. Bust to right. Beneath, J. Dubois F. Inscription: J. Rodolphe Perronet. Reverse. Né a Surène

près Paris en 1708. Mort en 1794.—Galerie métallique des grands hommes français.—1821. Bronze. 40 mill. See 317.

Kluyskens, ii., p. 308.

E. Sweden.

Eric Nordevall (1753–1835), Constructor of the Canal of Trollhättan.

299. Obverse. Bust to left. Beneath, M.F(rumerie). Reverse. View of the canal. Beneath, Trollhättan.Telge. Legend: Quas Natura Negat Præbuit Arte Vias. Exergue: Socio Meritiss. Reg. Ac. Scient. Suec. Bronze.

Duisburg, Suppl. II., 1868, p. 20.

F. Switzerland.

Hans Conrad Escher, of Zurich (1767–1823).

There are two medals of Escher, the second of which, referring to the drainage of marshes, is especially interesting in this connection.

300. Obverse. Bust. Beneath, P. Brueckmann. F. Inscription: J. C. Escherus Limagianus (his title, Von der Linth) Turicencis (of Zurich). Exergue: N(atus). 24 Aug. 1767. O(biit). 9 Mart. 1823. Reverse. Within an oak wreath, Ingenio Candore Virtute Civis Optimus.

Duisburg, p. 147, CCCXCVIII., no. 1.

301. Obverse. Bust. Beneath, Bory. Reverse. Jo. Conrado Eschero Lindomagico—Paludibus Siccatis—De Patria Bene Merito—Ob Cives Servatos—Honoris Et Virtutis Causa—Populus Helveticus—Ex Conventus Decreto. 1832.

Ibid., p. 148, CCCXCVIII., no. 2.

Other medals and tokens of drainage are the following:

A. The United States.

302. Obverse. An eagle, with shield, olive branch, and arrows. New York Grand Canal | Opened | 1823. Reverse. Tredwell | Kissam | & C° | (etc.etc.) N.Y. 17. Edges beaded. There are two varieties.

This rare token is in my collection. It was not in that of Fonrobert.

303. Obverse. Similar to preceding. Reverse. C & I.D. Wolfe | 87 | Maiden Lane | (etc., etc.) N.Y. 17.

This extremely rare token I also possess. It was not in the Fonrobert Collection. As to its date and that of the preceding, the Champlain Canal was completed in 1822 and the Erie in 1825.

304. Obverse. An eagle, head to left, with outstretched wings, stands upon half a globe, which surmounts the Arms of New York; a shield, upon which a rising sun behind mountains, and below upon a band, Excelsior. To left, the mouth of the canal; to right, the harbor of New York, with buildings and a ship. Inscription: Erie Canal Commenced 4 July 1817 Completed 26 Oct^{r} 1825. Beneath, Thomason. Reverse. The god Pan seated upon a cornucopia of fruits; in his right hand his pipes, his left arm around the neck of Neptune, who has his trident. In background, a lighthouse. Inscription: Union of Erie with the Atlantic. Tin. 50. 80 mill.

Fonrobert (Nord-Amerika), No. 2716.

305. Obverse similar to the last, save Comm. instead of Commenced, Comp. for Completed, and Oct. for Oct^{r}. The Thomason omitted, and in exergue: C. C. Wright Sc. | 1826 | Presented by the City Of N. York. Reverse also similar to preceding, but in exergue: R. Del.—W. Sc. Silver. Tin. 28. 48 mill.

Ibid., No. 2924.

This medal is very rare. It is in my collection.

306. 1825. C. & D. (Chesapeake and Delaware) Canal. J. Randel, Jr. (Woodward Sixty-seventh sale, no. 2292; "J. Randall," *Ibid.*, eighty-ninth, no. 735).

Four varieties, one with date.

B. England.

(*a*) *Basingstoke, Hampshire.*

307. Obverse. A boat under sail, to left. Inscription: Basingstoke Canal. Exergue: 1789. Reverse. A wheelbarrow, with pick and shovel crossed. John Pinkerton. Exergue: Value One | Shilling. Copper.

Boyne, "Silver Tokens of Great Britain and Ireland," 1866, p. 25.

Neumann, No. 22,838, fig.

A token for the navvies working upon the canal.

(*b*) *Gloucester, Gloucestershire.*

308. Gloucester and Berkeley Ship Canal (1827).

William Till Cat., 1846, Part III., No. 42 ; Doubleday sale (Sotheby of London), April, 1842, no. 206.

C. HOLLAND.

(*a*) *Harlem and Leyden.*

309. Obverse. The canal, with boat drawn by a horse. A band with two bells, and the legend Vicit Vim Virtus. Inscription : An. 1656. D. 26 Septembris Is De Treckvaart Van Harlem Op Leyden Begonnen MDCLVII. Is De Ecoste Schuit Gevaren. Reverse. An oak crown interlaced with coats-of-arms and the names C. Guldewagen, Matthias Stein, Drum Stein, Joh. Lof. Within the crown ; In Mem. Viae Munitae & Fossae Actae Ad Lintres Equo Trahendos In Usum Publicum & Commodum Viantium, Opus Ducentibus Hug. & Joan. Steincis, Exigentibus Publice IV. Vivis Cor. Gudelwagio, G. Fabritio, M. Steinio, F. Vouterio, Hunc Nummum Percussere Coss. Anni 1659. Silver.

Rivoire, Poulharies Cat., p. 242, No. 99.

D. FRANCE.

310. Le Canal d'Arles.

Sotheby & Wilkinson sale, London, 13 June, 1857, no. 18.

311. Le Canal Du Languedoc. Roussel. 1681. Bronze.

Ibid., p. 64, No. 40.

312. Similar to the above, but by Roussel and Maurer. Bronze.

Ibid., p. 69, No. 101.

313. Canal St. Martin (?). E. Launoy. Bon pour un franc. Octagonal.

Chapman sale, 15–16 Dec., 1885, No. 616.

314. Louis XVI. 1783. Utriusque Maris Junctio Triplex. Bronze. 73 mill.

315. Do. The Rhine-Loire Canal. Bronze. 50 mill.

Thieme, "Numismatischer Verkehr," Oct., 1887, no. 2302.

316. Do. 1785. Canal of the Saône to L'Yonne. New junction of the two seas. Iron. 56 mill.

Van Peteghem Cat., Paris, 15–17 Jan., 1887, No. 928.

317. Do. Canal De Bourgogne. Bronze. Two varieties.

Minart Cat., 1880, No. 3608.

In this connection see No. 298.

318. The Loire and the Saône. Obverse. River-god to left, his right hand holding a cornucopia and resting upon an urn, upon which, Loire. To left a nymph with a flowing urn, inscribed Saone. In background a winged figure, in whose left hand surveying instruments, and in the right a plan, upon which Digoin | Chal. Exergue: Tiolier F. Regie I Prairial | An 7. Reverse. Between two bunches of reeds, Canal | Du Centre | Ouvert | En Septembre | 1792. Octagonal. Brass. 22.

Hennin, "Histoire Numismatique De La Révolution Française," 1826, pl. 90, No. 887.

Neumann, No. 30,115.

319. Napoleon I. Canal De L'Ourcq.

Sotheby & Wilkinson sale, London, 13 June, 1857, No. 37.

320. Obverse. Female figures representing the Ourcq and the Seine, 1809. Reverse blank. Bronze. 26.

Chapman sale, 27–28 May, 1886, No. 921.

Possibly this may prove the same as the preceding.

321. Napoleon I. A half nude female steering a boat. Inscription: De mons À Condé.

Sotheby & Wilkinson sale, 13 June, 1857, No. 39; Haseltine sale, 30–31 Oct., 1878, No. 496.

322. 1825. Canal D'Aire À La Bassée—Pas-De-Calais. Silver. Octagonal.

Tarlier Cat., Paris, 1879, No. 566.

E. GERMANY.

(*a*) *Bavaria.*

323. 1846. Ludwig's Canal. A memorial conventionsthaler.

Coin Collectors' Journal, v., 1880, p. 169.

(*b*) *Coblentz.*

324. 1854. Opening of Rhein-Moselle Canal. Silver.

Zschiesche and Köder, "Verzeichniss," etc., Sept., 1885, No. 1961.

F. AUSTRIA.

(*a*) *Schemnitz, Hungary.*

325. 1765. Obverse. Bust of the Empress Josepha. Re-

verse. View of a mine. Aquae Subterraneae Domitae. Silver. Bronze. 47 mill.

Montenuovo Cat., Parts 9–14, Nos. 1963–64.

This was commemorative of the completion of the Franciscus drainage tunnel, and though it was primarily for mining purposes, it is of interest in the present connection.

326. Same as the preceding, save beneath the bust, Kaiserwert. Silver. 47 mill.—*Ibid.*, No. 1965.

See also No. 340—Suez Canal, visit of the Emperor Franz Joseph.

G. Russia.

327. 1866. Opening of the two Ladoga canals. Bronze. 68 mill.

Thieme, "Numismatischer Verkehr," Oct., 1887, No. 2500.

H. Italy.

(*a*) *Lombardy.*

328. 1777. The city of Milan personified, and Mercury, with the river-god of the Adda, and a view of Lake Como. Inscription: Commeatum Urbis Incremento. Silver. 50 mill.

Montenuovo Cat., Parts 9–14, No. 2078.

Upon the completion of the canal between Milan and Lake Como.

For the Mantua medal of 1756, see no. 347.

(*b*) *Tuscany.*

329. Obverse. Mailed bust of Cosmo de' Medici, to right. Cosmvs. Medices. Reipv. Floren. Dvx. II. Reverse. Within a crown, Pvblicae Salvti.

Litta, "Famiglie Celebri d' Italia," Med. 22.

Armand, ii., p. 197, No. 2.

330. Obverse. Similar bust. Cosmvs. Med. Floren. Et. Senar. Dvx. II. Reverse. Coelvm. Salvbre. Sirem. Within field, Siccatis. Maritimis. Palvdibvs.

Litta, Med. 41.

Armand, ii., p. 198, No. 11.

(*c*) *The States of the Church.*

331. 1588. Obverse. Bust of Pope Sixtus V. Reverse.

In background, a building flanked by trees. In front, a river. Between, fields with plan of drainage. Inscription: Pontinas. Paludes. Siccari. Concess. Exergue: 1588.

Bonanni, i., p. 381, fig. xxiii.

For Drainage of the Pontine Marshes.

332. In this connection a coin of Trajan, mentioned by Agostino (Pl. 76, No. 5), and bearing a female figure with wheel, and reed in her hand, is interesting. It commemorates the building of the Via Trajana, by which a portion of the Pontine marshes was reclaimed (Bonanni, i., p. 410). In the same group belongs the medal of Pope Pius VI., to be shortly mentioned, No. 336.

333. 1600. Pope Clement VIII. View of outlet of the canal constructed by him. Vellino Emisso. A(nno). MDC. Bronze. 25.

Bonanni, ii., pp. 457, 497, fig. 42.

This is in my collection.

334. 1735. Pope Clement XII. Secur — itas. Populi. Ravenn. | MDCCXXXV. Bronze. 24.

Rivoire, p. 291, No. 364. He omits to mention the legend.

Upon the prevention of inundation by the river Montone, near Ravenna. This is in my collection. There are other medals relative to inundations, floods, and the like, which are connected more or less directly with Section X., Epidemics.

335. 1763. Pope Clement XIII. View of the Tiber winding through an extensive territory. In foreground the river-god with flowing urn and upright cornucopia; Romulus and Remus, erect, play with the she-wolf (an unusual numismatic position of the twins relative to their foster-mother). Inscription: Navigatione Tyberis Restituta. Exergue: 1763.

This beautiful medal is in my collection. It refers not merely to removing obstacles to navigating the Tiber, but to the increased fertility of its banks by allowing more complete drainage.

336. 1791. Pope Pius VI. Agro. Pomptin. Colonis. Rest. | MDCCXCI.

To commemorate the drainage of the Pontine Marshes (see nos. 331 and 332). This is in my collection.

(*d*) *Kingdom of Naples.*

337. 1830. Francisco I. Daunia Ubertati Restituta. | MDCCCXXX. Bronze. 34.

This is in my collection. The medal is a very beautiful one. Daunia in ancient times was the territory upon the Adriatic, east of Naples and across the Apennines.

I. SPAIN.

338. Opening of the Canal of Isabel II. Silver.

J. AFRICA.

(*a*) *Port Said, Egypt.*

339. 1855. The canals Madschma El-Bahrein, El Menufje, and El Charbije. Copper. 64 mill.

Fonrobert (Australien, Asien, Afrika), No. 5295.

Upon laying the foundation of the protective fortress. I have already referred to the sanitary influence, through irrigation, of canals crossing sandy deserts.

(*b*) *Suez.*

340. Obverse. Bust of the Emperor Franz Joseph, of Austria. Reverse. The Pyramids and a ship, with a female figure seated upon the Sphinx. Adventvs. Avgvsti. In. Aegyptvm. | etc. By Tautenhayn. Silver. 71 mill.

Montenuovo Cat., Parts 9–14, No. 2735.

Upon the presence of the Austrian Emperor at the opening of the Suez Canal.

341. Obverse. Bust facing, within a circle, with fez. Around, Vive Ismaël Pacha Le Vice-Roi D'Égypte. 1869. Outside, an inscription in Turkish. Reverse. Within a similar circle, view of the canal, with vessels. Souvenir De L'Inauguration | Du | Canal De Suez | En L'An 1869. Outside, Turkish inscription. Tin. 38 mill.

Fonrobert (Australien, etc.), No. 5258, fig.

342. Obverse. Within a beaded circle, a three-masted ship, to right. Travaux Du Canal De Suez | Égypte. Reverse. Within a similar circle, Bon Pour | * I * | Franc. Inscription: Borel Le-Valley Et Comp^ie | 1865 Brass. 27 mill.

Ibid., No. 5296, fig.

343. Similar, for half-franc, save on reverse * 50 * | Centimes. Brass. 20 mill.

Ibid., No. 5297, fig.

344. Similar, for quarter-franc, save * 25 * | Centimes.

Van Peteghem Cat., 1874, No. 1010.

345. Similar, for fifth-franc, save * 20 * | Centimes. Brass. 18 mill.

Fonrobert (Australien, etc.), No. 5298.

K. Asia.

(*a*) *Island of Borneo.*

346. Inscription in Arabic, "Takiang-Kongsi," or, The Association of the Grand Canal. Tin.

Millies, "Recherches sur les monnaies des Indigènes de l'archipel Indien et de la péninsule Malaie," pl. XXIV., no. 258.

Schulman Cat., Amersfoort, Holland, Aug., 1887, no. 309.

To have given also the coins and medals relative to the building of bridges as well as of dykes would have been interesting in connection with the present section, but it would have carried us much too far from the central idea of sanitation. There is one, however, that comes especially within our province. It commemorates the completion, in 1756, of the works to preserve the city of Mantua from inundation, and from its inscription might well be included also in Section XII., Climate.

347. Obverse. Busts of the Emperor Franz I., of Austria, and Maria Theresa as Duchess of Mantua. Reverse. The floodgates of the River Mincio. Inscription: Salubritati aeris, navigationis et commercii perpetuitati prope gubern. inchoat.

Rivoire erroneously describes the device upon the reverse as the Hotel-de-ville of Mantua, and has the first word of the inscription in the genitive instead of the dative case.

Rivoire, p. 110, no. 170.

Montenuovo Cat., Frankfurt-on-Main, 1882, No. 1848.

Cavriani Cat., Milan, 1887, No. 2278.

(*To be continued.*)

EDITOR'S TABLE.

PHILADELPHIA AND NATIONAL QUARANTINE.

Philadelphia has long been remarkable for her effort to have her health protected by some outside power. Failing to realize that she has not been any more unfortunate than her sister seaports in having been born without a "quarantine," having ever neglected to provide, and fully recognizing the necessity of having one, she would now, as a means of shirking her long-neglected duty, subordinate the guardianship of the public health of all the seaports of the country to an imaginary system wholly devoid of a scientific basis or responsibility to any sanitary authority. Nearly thirty years ago the late Dr. Wilson Jewell, the most accomplished sanitary officer Philadelphia has ever had, after mature reflection and much labor, in conjunction with others bent upon securing a national quarantine, if practicable, became fully satisfied of the danger as well as fallacy of such an undertaking in advance of a national board of health, and henceforth to the end of his days he labored to that end. It was left for those who co-operated with him, and others no less meritoriously who followed, to realize, in 1879, what was *supposed* to be a substantial foundation, not for a national quarantine only but a national system of practical sanitation.

Among the foremost in procuring the law creating the National Board of Health, and without whose aid it would not probably have been procured, was the late John M. Woodworth, M.D., Supervising Surgeon-General of the United States Marine Hospital Service. The law was sufficiently comprehensive to take cognizance of the relative danger of preventable diseases from domestic or internal sources on the one hand, and of foreign or external sources on the other; and the board which it created showed a wise discrimination in the exercise of its functions with regard to the relative importance of these two sources, into which all infectious diseases may be divided, and prosecuted its work accordingly. It did not neglect quarantine, or the diseases against which it could be made

effective, however, but, considering that the danger to the public health from preventable diseases from internal sources are more than a hundredfold greater than it is from external sources, the board's attention was chiefly devoted to the investigation and prevention of the former.

Yet quarantine regulations were carefully formulated, a considerable number of quarantines were revised, and several refuge stations selected, with a view to such ultimate equipment as would, under intelligent supervision, most effectually overcome all danger from external sources.

Very early in the progress of the board's operations and intentions, it became apparent that Supervising Surgeon-General, John B. Hamilton, M.D., the successor of Dr. Woodworth, conceived himself to be much more competent to conduct the quarantine service without the co-operation of the National Board of Health than with it. But since the law bound him, in some degree, to co-operation with the board, he appears to have determined that, sooner than suffer any restraint with regard to quarantine, he would destroy the board; and, fortified by political strength and patronage, of which the board was wholly devoid, he was not long in carrying his purpose into effect, and with such success as to leave him the master of the situation; *he* is the national quarantine, under whose ægis the physicians of Philadelphia ask protection not only for themselves but for all the ports of the United States. Dr. Hamilton's record as a director of quarantine is by no means flattering to his practical knowledge of quarantinable diseases, or to his executive skill in preventing them. On the contrary, his practice at Brownsville, Key West, and Tampa, as compared with the work of the National Board of Health at Memphis and New Orleans, is abundantly suggestive of the much greater importance of a national board of health as an *essentially necessary* condition of a national quarantine, and, besides, for other reasons, eminently more worthy of the efforts of all persons interested in the protection of the public health than Philadelphia's pet scheme. Yet, if Philadelphia is bent upon giving Dr. Hamilton's system a trial, the recent health laws of the United States abundantly provide for her so doing. It is her privilege to relinquish all authority over her quarantine, and request the United States Treasury De-

partment to take charge of it. She can doubtless be accommodated with all of the essential details, one of which should certainly be (in the light of a recent example) the supply of pure water to ships.

IF the sanitarians throughout the country could be roused to the necessity of united effort for the rehabiliment of the National Board of Health, or what would be better, such a modification of the law creating it as would render it independent of all entangling alliances as a central sanitary authority, by which all sanitary regulations of any place whatever could be made to bear with equal force against the toleration or propagation of disease as against its introduction, and by which authority to prevent the introduction of disease at any place should be equally applicable against its exportation, we might reasonably hope for such practical measures of port and maritime sanitation as would so effectually commit "quarantine" to the shades of the past as never to hear the word mentioned as a measure for the protection of the public health.

SOME NEW SANITARY PERIODICALS,* AND ENGLAND'S PRACTICE AS OPPOSED TO ENGLISHMEN'S PRECEPTS WITH REGARD TO "QUARANTINE."

IF the increase in the number of periodical publications devoted to the promotion of the public health be an indication of increasing interest in the subject, the signs of progress in this direction are certainly encouraging. But unfortunately there is too much room for the belief, judging from the ephemeral existences of many heretofore, that, excepting those which are devoted more to trade than to sanitation (which are not the subject of this notice) they will be disappointed in their expectations of support. Yet the object is laudable—

* *La Salute Publica*, Giornale Mensile d'Igiene Rublica e Privata, diretto dal Datt. Carlo Ruata, Prof. di Materia Medica all' Universita. Perugia, dalla direzione del giornale, 1888.

Giornale della Reale Societa Italiana d' Igiene, Milano, Stabilimento Giuseppe Civelli, a Spese della Reale Societa Italiana d'Igiene, 1888.

Zdrowie, Miesiecznik Poswiecony Hygienie Publicznej i Prywatnej. Adres Redakcji St.—Krzyzka 25. Warszawa w Drukarni St.—Niemiery, Plac Warecki N. 4, Grudzien, 1887.

Spitalul, Revistâ Medicalâ, Bucuresci Typo-Litografia Stefan Mihalescu, strada Covaci 14.

some headway is made by every such effort. They are generally the outcome of an earnest desire to instruct the public, and thereby promote the general welfare, on the part of professional men, who have enjoyed exceptional opportunities either in the laboratory or in the public service, to study the nature of disease and the best means of preventing it. If true to the principles they profess to advocate, they will support the broadest views regarding public health, while basing them on well-defined and well-tested scientific principles. They should be, as far as possible, free from strictly technical language, so as to be within the comprehension of the readers for whom they are intended, because sanitary regulations are always intended to prevent sickness among the people.

The new advocates before us have faith in civic authorities to protect the unsuspecting from danger; they comprehend the relation of the house to its occupants, and their purpose is to make it the abode of comfort and of health; they have made analyses of such food as is eaten, water drank, and air breathed, with a view to guarding against the insidious attacks of disease from many causes, the existence of which the people do not suspect. More than a quarter of a century ago Virchow, in his *Archiv*, pointed out the tendency to this change in a graphic phrase, that "medical reform has had its day, and sanitary reform is the question of the hour," * which has been extensively echoed.

In promoting this reform the medical profession has stood almost alone; it has been obliged to combat public opinion and public prejudice at every point; to advance step by step against the most obstinate resistance on the part of those for whose benefit so many reforms have been intended; to wring from the people the recognition of such measures as have been deemed necessary to protect their own health and lives. Are the people wiser or more liberal-minded to-day? Are they more willing to put in operation such measures as are necessary for the prevention of disease? Do they not lend a more willing ear to the cry of "economy," and to every objection that may be raised against sanitary reform by those whose habits and training render them entirely incompetent to judge

* Auch die Medicinische Reform hat ihre Zeit gehabt und das Vornehmen der öffentlichen Gesundheitspflege geschah zu seiner Stunde. June 29, 1869.

of what constitutes sanitation or of the best means of securing it?

Many foreign writers have appropriated the keynote to the importance of sanitation, first expressed by one of our greatest statesmen and foremost philosophers, several generations ago, that "public health is public wealth." Finkelnburg, in his "History of Sanitary Legislation in England," has selected it as the maxim of his title-page, Pettenkofer repeats it in his "Popular Lectures," and many periodicals emulate THE SANITARIAN in reverberating it. "La Salute Publica" has engraved on the shield of its title-page: "La Salute Publica e Publica rigghezza."

But some hastily formed, indeed, wholly unsupported opinions with regard to the substantial progress of modern sanitation, often find utterance in the new literature of the subject, to which we would, in this connection, invite particular attention. For example: Finkelnburg says (in "Die Oeffentliche Gesundheitspflege Englands"—Public Health in England): "That all the nations of German origin, including England, are influenced by the love of personal liberty and self-reliance, while all those of Latin origin are characterized by a preference for a centralized governing power;" and he adds: "The United States of North America are the most advanced representatives of the former class." How wisely, we may inquire, do we employ this personal liberty in guarding public health? And *La Salute Publica* holds up England as "the only nation that has labored for many years with untiring efforts to lessen the public mortality," and gives as conclusive evidence of this the diminished death-rate in half a dozen English cities for a score of years past.

The *Zdrowie* is hardly less outspoken in its praise of English reforms and English reformers. Of one of them it says: "Edwin Chadwick podnosi koniecznosc utworzenia niezaleznego ministerjum zdrowia publicznego;" thus giving him the highest praise for his services to public health. Baldwin Latham is the great engineer who has done so much for the sanitation of Croydon, and Farr and Paget receive great praise. These eminent philanthropists deserve all the praise that has been bestowed upon them for their disinterested efforts in the cause of public health, but there are other eminent men, in

other countries, who have given much time and thought to the promotion of public health, and who, by their writings and continued investigation of the nature of infectious diseases, have become the benefactors of mankind generally, as well as of their own country. There are many cities outside of England in which the introduction of pure water and improved sewerage have reduced the mortality quite as much as in English cities: Frankfort, Wiesbaden, Stuttgart and Carlsruhe, and, most notably, Dantzic, on the Baltic, and Lintz, on the Danube, are examples.

But without particularizing what is done in other countries or by whom, it would be very reasonable to ask what is done for the rural districts of England. Has their condition, also, been greatly improved within the last quarter of a century? Notoriously the sanitation of the rural districts has not kept pace with the city populations. What sanitary measures have been introduced into the vast mines in which thousands of human beings are constantly employed? Some, it is true; but little in proportion to the extraordinary needs. These people work thousands of feet below the surface of the earth; they are born, reared, and educated there; they spend their lives there, and die, some of them, it is said, without having ever seen the light of the sun. They are not troubled with sewer-gas; they rarely suffer from marsh fever; they do not trouble themselves about subsoil drainage or the disposal of garbage; the question of pure air and pure water is of little account; they are not interested in the comparative merits of earth closets or of any other closets; churches and schoolhouses are of little interest; in short, the atmosphere, both moral and physical, might with advantage be greatly improved.

Moreover, the English outside of England, with the exception of a few philanthropists and some professional men, are solely influenced by the greed of gain, even to the sacrifice of health to other people. They see the advantage of keeping their factory operatives and artisans employed at home, and to force their merchandise into every market in the world. They send opium to China and war-ships to compel the people to receive it. They send bad whiskey and other vile compounds of alcohol to the savages of Asia and Africa in ex-

change for ivory and other valuable commodities. They bring cholera from India to the ports of the Red Sea under cover of a clean bill of health, and distribute it at the seaports on the route. If it be overland, they leave the sick, the dying, and the dead to spread the disease round about. They convey it to China and Japan, and, pushing the freedom of commerce against all restrictions, risk its introduction at every port on the Mediterranean into which they can force an entrance. But they are careful not to land it in England.

For, most remarkable of all, while the English denounce all quarantine regulations if maintained in Italy, in France, or in Spain, they enforce the most rigid quarantines at their own ports of any people in the world, even to the extent of entire exclusion, as we have before taken occasion to point out. Yet, so accommodating is England, in this respect, that while she prohibits the entry of infected ships and cargoes at her own ports, she gives them new clearances, with clean bills of health to foreign ports! And when the filthy ships and cargoes thus *forwarded* by English practice arrive at, and infect the seaports of other countries, English preaching is never wanting to make it appear that all the blame rests upon the filthy localities and habits of the people to whom she has sent her infected ships and cargoes. And, unfortunately, there are commonly found in other countries, as in the United States, a sufficient number of superficial "health" officers, who limit their knowledge to steamship companies' literature, who are careful to keep scrap-books for the edification of cut-and-dried tools for the promotion of their purpose, with a total disregard of the public health.

This is no fancy sketch. We took occasion in our immediately preceding issue to cite an example at Tampa, Fla., where there has been a criminal sacrifice of human life under the auspices of just such literature.

And the people of Southern Europe will do well, also, to seriously reflect upon the statement of Finkelnburg, as above quoted, and his further statement that the people of Northern Europe enjoy more political freedom than those of the South. They have equal reason to rejoice in their relative exemption from infectious diseases, because they are so much less subject to their introduction by English commerce than are those of Southern Europe.

Sanitarians who are alive to English practice, as against Englishmen's preaching, with regard to quarantine, will not be misled by the formulated resolutions which are the common stock-in-trade of English delegates at sanitary conferences, or the balderdash of her multitude of essayists for the promotion of commerce in disease. They will look at England's practice at home; be careful to obtain and study the reports of her port sanitary authorities, and learn with what care she excludes infectious ships, merchandise, and diseases from her own doors; her continuous watchfulness and reports with regard to cholera, especially, at foreign ports; the names and dates of all vessels sailing from such ports, and whence; and her admirable precautions against the introduction of cholera. By thus doing they will acquire knowledge of practical sanitation to which the word "quarantine" is in no respect an index. Indeed, this word should be dropped from the vocabulary of sanitarians everywhere; it is opposed to *practical work* for the prevention of disease, and the time necessary for its exercise and to cover the incubation period of infectious diseases is all the detention that accomplished sanitarians now require anywhere.

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* reports for the month of December 64 deaths in a population estimated at 31,295, of which 19 were under five years of age, and representing an annual death-rate of 24.48 per 1000. From zymotic diseases there were 7 deaths, and from consumption, 9.

CALIFORNIA.—The Secretary's report from 68 towns, for the month of December, indicates a slightly increased death-rate over the mortality reported in November; in the latter month the percentage per thousand in the month being 1.54 in a population estimated at 754,950; whereas, in December, in an estimated population of 608,800, the deaths numbered 1053. The increased mortality may fairly be attributed to the greater prevalence of pulmonary diseases, including croup and diphtheria as affecting the air passages, and typhoid-fever and diarrhœa and dysentery as affecting the alimentary canal.

Deaths from consumption, 173; acute pulmonary diseases, 147; Diphtheria and croup, 59; typhoid-fever, 54; typho-malarial-fever, 6; measles, 17; scarlet-fever, 3; cerebro-spinal-fever, 18; small-pox, 13. Annual death-rate per 1000, 20.33.

CONNECTICUT.—The Secretary's report of mortality throughout the State, and particularly in the 28 towns of more than 5000 inhabitants each, aggregating 454,400, and 106 other towns of less than 5000 inhabitants, aggregating 223,048 inhabitants, during the month of December indicate a continuous state of good health. Total number of deaths in the 28 larger towns, 571; in the 106 smaller, 299: 870. The death-rate being 15.3 per 1000 in December against 14.2 in November. The excess is due to the greater mortality in the colder month from diseases affecting the lungs. In November the deaths from consumption, pneumonia, and bronchitis, altogether, numbered 174, while in December the aggregate was 247. The deaths from the so-called zymotic diseases were somewhat less in December than in November.

The common belief that the country is healthier than the city is not borne out by the statistics of December. The annual death-rate for that month in the ten urban towns of the State was 15.3 per 1000, and that was exactly the annual death-rate for the whole State.

DELAWARE.—*Wilmington* reports for the month of December 90 deaths in a population estimated at 57,000, of which 27 were under five years of age, representing an annual death-rate of 18.95 per 1000. From zymotic diseases there were 15 deaths, and from consumption, 16.

ILLINOIS.—At the annual meeting of the State Board, January 12th–13th, the Secretary summarizes the reports and correspondence with regard to the cholera in quarantine at the port of New York, concluding with the proposition, which he has before urged, "That the only wise thing to do in respect of cholera is to resist the first beginnings" (by prohibiting commercial intercourse with cholera-infected countries). "This country can be protected against the disease only by its absolute exclusion. The arguments against quarantine which may be valid enough for Great Britain do not apply

here." A proposition wholly impracticable, and an admitted argument decidedly erroneous. Indeed, nothing appears to us more preposterous than the suggestion of prohibiting commerce with ports infected with cholera or any other infectious disease; because commerce is so far-reaching and the liability of ships and certain kinds of merchandise so liable to convey infection—differing greatly, however, in its liability to introduction in different ports—that if it were possible to maintain such a prohibition it would well-nigh put an end to commerce. The proposition is the more surprising since Dr. Rauch is well known to be a believer in the efficiency of properly conducted port sanitation to exclude it, than which no better proof exists than the practice of England, which he fails to recognize, while he refers to "arguments against quarantine" emanating from that country, wholly inconsistent with her practice as animadverted upon more in detail on a preceding page.

Moreover, the protection of the public health, considered on its highest plane, should always contemplate the *promotion* of commerce. An international system of port and maritime sanitation, such as may be deduced from the recommendations of the report of the Committee on Quarantine Regulations, approved by the National Quarantine and Sanitary Association of the United States at Boston, 1860, with regard to "measures relating to departure," and "during the voyage," as well as "on arrival," should be the aim of all sanitarians; because with it the promotion of commerce may be made perfectly consistent with the protection of the public health the world over, no less effectually than it was on the Mississippi River and its tributaries by the signal service of the work of the National Board of Health with regard to steamboats and other vessels before departure at New Orleans in 1879.

Chicago reports for the month of December 1072 deaths in a population estimated at 760,000, of which 423 were under five years of age, and representing an annual death-rate of 16.93 per 1000. From zymotic diseases there were 222 deaths, and from consumption, 101.

Rock Island reports for five weeks ending December 31, 18 deaths in a population estimated at 13,655, of which 12 were under five years of age. Death-rate, 13.7 per 1000. From

zymotic diseases there were 8 deaths, and from consumption, 1.

IOWA.—Monthly *Bulletin* reports for the year 1887.

Davenport, 823 deaths; of these 622 were from measles, 162 from diphtheria, and 30 from scarlet-fever; of the total of deaths, 158 were under five years of age. Death-rate per 1000 population, 13.3. Total population, 30,084.

Burlington, 393 deaths; of these 152 were under five years of age. Death-rate per 1000 population, 13.8. Population, 30,166.

Keokuk, 191 deaths. Death-rate per 1000 population, 13.64. Population, 14,000. But 3 deaths from scarlet-fever and 1 death from diphtheria indicates a remarkable enforcement of sanitary regulations.

Des Moines reports for the year ending October 1st, 540 deaths. Death-rate per 1000 population, 12. Population, 45,000; of the total deaths, 211 were under five years of age.

LOUISIANA.—*New Orleans* reports for December 333 deaths in 176,500 white population, and 205 deaths in 66,250 colored population, making the respective death-rates 22.64 and 37.13 per 1000, and 26.59 for the whole population of 242,750. The deaths from zymotic diseases numbered 93, and from consumption, 59. There were 185 deaths under five years of age.

MARYLAND.—*Baltimore* reports for five weeks ending December 31st, 723 deaths in a population estimated at 437,155, of which 281 were under five years of age. Death-rate, 17.82 per 1000. From zymotic diseases there were 102 deaths, and from consumption, 94.

MASSACHUSETTS.—*Boston* reports for the month of December 872 deaths in a population estimated at 400,000, of which 273 were under five years of age, and representing an annual death-rate of 25.6 per 1000. From zymotic diseases there were 158 deaths, and from consumption, 123.

MICHIGAN.—The Secretary reports for the month of December, 1887, compared with the preceding month, the returns

indicate that tonsilitis and bronchitis increased, and that typho-malarial-fever decreased in prevalence.

Compared with the average for the month of December in the nine years 1879–87, measles were more prevalent, and intermittent-fever, typho-malarial-fever, whooping-cough, and consumption of lungs were less prevalent in December, 1887.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of December, 1887, at 38 places, scarlet-fever at 30 places, typhoid-fever at 20 places, and measles at 18 places.

Reports from all sources show diphtheria reported at 25 places less, scarlet-fever at 6 places less, typhoid-fever at 19 places less, and measles at 2 places more in December, 1887, than in the preceding month.

Compared with the preceding month, the temperature in the month of December, 1887, was considerably lower, the absolute humidity was considerably less, the relative humidity was considerably more, the day ozone was slightly more, and the night ozone was more.

For the month of December, 1887, compared with the average of corresponding months for the nine years 1879–87, the temperature was about the same, the absolute and the relative humidity were about the same, the day ozone was considerably less, and the night ozone was slightly less.

At the meeting of the Board, January 10th, Professor Victor C. Vaughan, M.D., made his first quarterly Report of the Michigan State Laboratory of Hygiene, of which he is director. Professor Vaughan's report includes three subjects: (1) The important results of the investigations into the Causation of Typhoid-fever, stating the details of the experiments whereby the "germs"—the bacilli of typhoid-fever—were proved to be in the water supposed to have caused the typhoid-fever at Iron Mountain, Mich., in October, 1887; and whereby, through the injection of the "germs," a disease in some respects similar to typhoid-fever was produced in an animal, and, through injection of a ptomaine formed by the germs and chemically separated from the germs, an abnormal rise of body temperature was produced in an animal. (2) The complete account of the four cases (three fatal) of tyrotoxicon poisoning, near Milan, Mich., in September, 1887, and the experiments

indicating that the poison may be generated in soil saturated with decomposing milk. (3) The investigations which exposed a fraud which was putting into the hands of pharmacists and physicians a drug claimed to be a harmless product of the honey locust-tree; but which was found to be a dangerous mixture of cocaine and atropine.

Detroit reports for the month of December 214 deaths in a population estimated at 200,000, of which 51 were under five years of age, and representing an annual death-rate of 12.59 per 1000. From zymotic diseases there were 44 deaths, and from consumption, 16.

MINNESOTA.—*Bulletin*—treble number—for the months of October, November, and December, reports the work for those months so heavy as to prevent the regular issue. Infectious diseases reported during the three months: Diphtheria, 308 cases, 73 deaths; scarlatina, 76 cases, 5 deaths.

Diseases of animals: Glanders remaining, October 1st, 1887, 37; November 1st, 35; December 1st, 54. Reported during the three months, 80; killed, 46; released, 7; remaining, January 1st, 1888, unaccounted for, 64.

St. Paul reports for the month of December 128 deaths in a population estimated at 150,000, of which 66 were under five years of age, and representing an annual death-rate of 10.02 per 1000. From zymotic diseases there were 41 deaths, and from consumption, 9.

MISSOURI.—*St. Louis* reports for the month of December 746 deaths in a population estimated at 420,000, of which 287 were under five years of age, representing an annual death-rate of 21.30 per 1000. From zymotic diseases there were 213 deaths, and from consumption, 75.

For the year ending December 31st, 1887, total deaths from all causes, 9155; from zymotic diseases, 2549; deaths under five years of age, 3795. Death-rate, estimating the population at 420,000, 21.8. Of the deaths from zymotic diseases, 1112 were from diphtheria and croup; from diarrhœal diseases, 477; typhoid-fever, 116; malarial-fevers, 304; puerperal-fever, 64; scarlet-fever, 48; measles, 40; whooping-cough, 12; other zymotic diseases, 376.

NEW JERSEY.—*Newark* reports for the month of December 367 deaths in a population estimated at 167,460, of which 159 were under five years of age, and representing an annual death-rate of 26.37 per 1000. From zymotic diseases there were 83 deaths, and from consumption, 32.

Paterson reports for the month of December 118 deaths in a population estimated at 69,000, of which 58 were under five years of age, representing an annual death-rate of 20.52 per 1000. From zymotic diseases there were 38 deaths, and from consumption, 12.

NEW YORK.—The *Bulletin* for the month of December, 1887, reports the total mortality of 126 towns of 3000 inhabitants and upward, comprising a population of about 3,500,000, for the month, 7886, of which 31.6 per cent were under five years of age. From zymotic diseases there were 1500 deaths, a ratio of 190 per 1000 total mortality. From diarrhœal diseases the ratio per 1000 is 9.85; from typhoid-fever, 13.19; from croup and diphtheria, 111.97. In December, 1886, the ratio for these three diseases, respectively, was 14.08, 14.73, and 87.37. Diphtheria is reported from 66 of the 124 specified localities; 59 per cent of the zymotic mortality is from this disease. Scarlet-fever is reported from 20 of the localities specified in the *Bulletin*. From small-pox 12 deaths are reported, from New York, Brooklyn, the Kings County Hospital at Flatbush, the town of Canarsie in Kings County, and from Albany; it appeared in Albany in December, where there are now 6 cases; and single cases have been reported during January from the town of Milo, Yates County (the origin of which is attributed to imported paper rags), from the town of Cortlandt near Peekskill, from Springwater, Livingston County, and from the town of Barton, Tioga County; the latter originated in Potter County, Pennsylvania; the others probably are to be traced to New York or Brooklyn. From consumption the ratio of mortality is 129.61 per 1000, and 190.00 per 1000 above five years of age. The combined death-ratio from consumption, zymotic, and puerperal diseases is 328.43 (336.00 in November). From acute respiratory diseases the death-rate per 1000 is 152.82.

Summary for the year 1887.—The State is divided into

sanitary districts as follows: *Maritime* (population in 1880, 2,098,589; present estimated city population, 2,280,000): Includes New York, Long Island, Staten Island, and Westchester County. *Hudson Valley* (population in 1880, 750,143; present estimated city population, 250,000): All the counties on either side of the Hudson River except Westchester, to and including Albany and Rensselaer. *Adirondack and Northern* (population in 1880, 330,434; present estimated city population, 23,200): The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson, and Lewis. *Mohawk Valley* (population in 1880, 280,809; present estimated city population, 80,000): Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer, and Oneida counties. *Southern Tier* (population in 1880, 365,746; present estimated city population, 60,000): The seven counties along the southern border of the State. *East Central* (population in 1880, 354,320; present estimated city population, 78,000): Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga, and Cortland counties. *West Central* (population in 1880, 321,247; present estimated city population, 26,000): Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee, and Wyoming counties. *Lake Ontario and Western* (population in 1880, 578,705; present estimated city population, 350,000): Oswego, Wayne, Monroe, Orleans, Niagara, and Erie counties. No census of the State has been taken since 1880; the population may be estimated at about 5,500,000.

The average death-rate of 87 regularly reporting localities is 23.00 per 1000 population, their population aggregating 3,500,000; all of the 27 cities except three of the smaller ones being included. The average death-rate of 63 localities, ranging in population from 3000 to 13,000, the total being about 375,000, was 18.40 per 1000 population for the year; 28.5 per cent were under five years of age. At a death-rate of 18.40 per 1000 the total deaths in the State for the year would be 101,200. Besides the 96,453 deaths noted above a considerable number of returns are received too late to be included in the monthly issues of the *Bulletin*.

From zymotic diseases the rato per 1000 total mortality was 227.80 in 1887, against 217.23 in 1886, 222.17 in 1885, and

269.12 in 1884. The death-rate from diarrhœal diseases was unusually high, as shown by one of the above tables; that of diphtheria was also increased. The mortality from scarlet-fever was 13.14 per 1000; in 1886 it was 11.65. Measles had a large death-rate in the early months of the year, its increase in prevalence having begun in November, 1886. Small-pox during the year existed only in the maritime district save a limited outbreak in January in Albany, where it has reappeared in December; other sporadic cases are reported elsewhere in the State at the beginning of 1888. Besides these there was no exceptional prevalence of other zymotic diseases during 1887.

New York City, for the month of December, 1,481,920: Deaths, 3043, representing an annual death-rate of 44.58. Deaths under five years, 1140, 37.4 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 12; typhoid-fever, 22; malarial diseases, 30; small-pox, 1; scarlet-fever, 99; measles, 24; erysipelas, 14; whooping-cough, 10; croup and diphtheria, 315; diarrhœal diseases, 43; zymotic diseases per 1000 deaths from all causes, 187.30. Consumption, 438; acute respiratory, 569; puerperal diseases 35.

Brooklyn, 757, 755: Deaths, 1455; death-rate, 23.1; deaths under five years, 558—38.3 per cent of total. From zymotic diseases: Typhoid-fever, 15; malarial diseases, 26; scarlet-fever, 46; erysipelas, 5; whooping-cough, 7; croup and diphtheria, 207; diarrhœal diseases, 12; zymotic diseases per 1000 deaths from all causes, 215.12. Consumption, 167; acute respiratory diseases, 290; puerperal diseases, 14. Small-pox reported under that head on a succeeding page.

Buffalo, 202,818 (for four weeks ending December 31st): Deaths, 226; death-rate, 19.36; deaths under five years, 92—40.7 per cent of total. From zymotic diseases: Cerebro-spinal meningitis, 2; typhoid-fever, 6; malarial diseases, 1; scarlet-fever, 8; measles, 2; erysipelas, 1; whooping-cough, 3; croup and diphtheria, 30; diarrhœal diseases, 2; zymotic diseases per 1000 deaths from all causes, 243.36. Consumption, 30; acute respiratory diseases, 23; puerperal diseases, 2.

Rochester, 110,000: Deaths, 160; death-rate, 17.40; deaths under five years, 44—27.5 per cent of total. Deaths from

zymotic diseases: Typhoid-fever, 3; croup and diphtheria, 22; zymotic diseases per 1000 deaths from all causes, 168.70. Consumption, 26; acute respiratory diseases, 17.

Albany, 96,000: Deaths, 177; death-rate, 22.12; deaths under five years, 43—24.29 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 7; small-pox, 1; scarlet-fever, 13; measles, 1; erysipelas, 1; croup and diphtheria, 14; zymotic diseases per 1000 deaths from all causes, 220.33. Consumption, 27; acute respiratory diseases, 19.

Syracuse, 78,000: Deaths, 118; death-rate, 18.28; deaths under five years, 42—35.6 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 2; scarlet-fever, 2; measles, 7; erysipelas, 1; croup and diphtheria, 10; zymotic diseases per 1000 of total, 220.34. Consumption, 15; acute respiratory diseases, 24; puerperal diseases, 3.

Lowest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the lowest death-rates during the month of December, were Jamaica (10,089), 9.60; Auburn (26,000), 12.00; Ogdensburg (11,000), 13.09; Ithaca (10,000), 14.40; Binghamton (25,000), 14.80.

Highest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the highest death-rates during the same month were Hudson (10,000), 40.80; Amsterdam (14,000), 36; Newtown (10,000), 32.40; Troy (65,000), 28; Long Island City (21,000), 25.14.

OHIO.—The *Monthly Sanitary Record*, for January, 1888, the first number of a periodical whose object is stated to be "to bring before the public items of general sanitary interest, to point out the existence and suggest remedies for dangers to life and health arising from avoidable causes, to form a medium of communication with local Boards of Health and health officers, and to record sanitary movements throughout the State," reports for the month of December, 1887, the total mortality of 30 towns of 1600 inhabitants and upward, comprising a population of 964,150, 1478; annual death-rate, 15.55; deaths under five years of age, 495; deaths from zymotic diseases, 358, the chief of which were diphtheria and croup, 148, typhoid-fever, 110. Of the whole number from typhoid-fever, 89 occurred in Cincinnati.

PENNSYLVANIA.—*Philadelphia* reports for five weeks ending December 31st, 1805 deaths in a population estimated at 993,801, of which 524 were under five years of age. Death-rate, 24.5 per 1000. From zymotic diseases there were 200 deaths, and from consumption, 263.

Pittsburg reports for five weeks ending December 31st, 432 deaths in a population estimated at 200,000, of which 137 were under five years of age. Death-rate, 21.4 per 1000. From zymotic diseases there were 83 deaths, and from consumption, 33.

RHODE ISLAND.—*Providence* reports for the month of December 237 deaths in a population estimated at 121,500, of which 82 were under five years of age, and representing an annual death-rate of 23.31 per 1000. From zymotic diseases there were 61 deaths, and from consumption, 32.

TENNESSEE.—The State Board *Bulletin* reports for the month of December the principal diseases named in the order of their greater prevalence in the State for December, were pneumonia, catarrhs, malarial-fever, consumption, bronchitis, rheumatism, tonsilitis, dysentery, diarrhœa, and cholera infantum. Typhoid-fever was reported in the counties of Chester, Cocke, Davidson, Dyer, Franklin, Gibson, Hamilton, Hawkins, Haywood, Marshall, Pickett, Putnam, Rutherford, Shelby, Sullivan, Van Buren, and Wilson. Measles in Crockett, Dyer, Gibson, Humphreys, Lake, Lauderdale, Marshall, Overton, Sumner, Washington, Wayne, and Wilson. Diphtheria in Davidson, Franklin, James, Knox, Lauderdale, Morgan, Rutherford, and Shelby. Whooping-cough in Bradley, Cumberland, Davidson, Gibson, Humphreys, Knox, Morgan, and Overton. Scarlet-fever in Davidson, Knox, Marshall, Shelby, Washington, and Williamson. Mumps in Lake, Overton, Putnam, Sullivan, and Washington. Chicken pox in Lake, Sullivan, Washington, and Williamson. Roseola in Decatur and Williamson. Erysipelas in Decatur and Morgan.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga,	white,	14.33 ;	colored,	33.69 :	21.13
Clarksville,	"	16.20 ;	"	30.33 :	18.37
Columbia,	"	13.80 ;	"	18.82 :	16.00
Knoxville,	"	15.94 ;	"	31.80 :	19.20
Memphis,	"	16.73 ;	"	35.97 :	23.56
Nashville,	"	12.23 ;	"	23.93 :	16.80

The special *meteorological* features for December were the heavy rainfall of the 31st and the absence of any electrical disturbance except on that day. The mean temperature was 38.6°, about the normal for the past five years, the greatest during that period being 42.87° in 1883, and the least 34.6° in 1886. The highest temperature was 65°, recorded on the 3d and 6th, and was by several degrees the lowest December maximum during the period above named. The lowest temperature was zero, recorded on the 29th, and was 8° above the December minimum of 1886, 12° above the December minimum of 1883 and 1885, and 1° above the December minimum of 1884. The ranges of temperature were less than the normal. There were four cold-wave warnings received during the month—viz., 4th–5th, 11th–13th, 19th–22d, and 27th–29th, all fully verified.

The mean precipitation for the month was 5.05 inches, nearly one inch above the December mean of the past five years.

VIRGINIA.—*Richmond* reports for the month of December 142 deaths in a population estimated at 100,000, of which 41 were under five years of age, and representing an annual death-rate of 17.04 per 1000. From zymotic diseases there were 16 deaths, and from consumption, 21.

WISCONSIN.—*Milwaukee* reports for the month of December 196 deaths in a population estimated at 180,000, of which 31 were under five years of age, and representing an annual death-rate of 13.1 per 1000. From zymotic diseases there were 43 deaths, and from consumption, 16.

CHOLERA, according to the most recent reports at the time of this writing (Surgeon-General Hamilton's Weekly Abstract of Sanitary Reports received through the Department of State,

February 10th, 1888), still prevails at Valparaiso, at least, if not at some other South American ports on the Pacific. "The United States Minister at Lima, under date of January 5th, transmits a translation of a cutting from *El Comercio*, Lima, January 4th, relative to the cholera in Valparaiso, as follows:

"'Though we have no official telegram upon the state of the epidemic in Chili, we know of a telegraphic despatch received by private persons from Valparaiso stating that *the flail* is making many victims, and has reached up to 130 cases daily, deaths being from 80 to 90.'"

At Madras, during the three weeks ending December 16th, the number of deaths reported from cholera was 53.

During the three months ending December 31st, the number of deaths reported from cholera was, in Bombay, 165; Calcutta, 174; Madras, 124.

SMALL-POX continues with increasing prevalence in Brooklyn and San Francisco. Brooklyn.—During the month of January the number of cases reported was 71, with 13 deaths.

San Francisco, January 1st to 17th, there were reported 123 cases.

Abroad, during the *three weeks* ending January 21st, the number of deaths reported from small-pox was, in London, 1; Leeds, 6; Sheffield, 79; Bristol, 5; Paris, 19; Lyons, 2; Reims, 1; Amiens, 1; Berlin, 7; Dresden, 2; Frankfort, 1; Strasburg, 1; Altona, 1; Mayence, 2; Mens, 1; La Louvière, 5; Nivelles, 3; Vienna, 7; Pesth, 5; Prague, 60; Trieste, 24; Warsaw, 5; Rome, 14; Valencia, 2. During the *three months*, ending *December 31st:*

London, 3; Birmingham, 1; Dublin, 1; Leeds, 1; Sheffield, 230; Edinburgh, 1; Bristol, 11; Hull, 2; Rotterdam, 2; Paris, 79; Lyons, 5; Marseilles, 6; Bordeaux, 4; Nantes, 4; Havre, 6; Reims, 2; Nancy, 1; Amiens, 2; Nice, 26; Brussels, 1; Louvain, 1; Jumet, 11; Nivelles, 9; Soignies, 1; Peruwels, 5; Dinant, 1; Vienna, 15; Pesth, 31; Prague, 94; Trieste, 142; Presburg, 13; St. Petersburg, 12; Warsaw, 178; Odessa, 1; Saragossa, 60; Bucharest, 8; Cairo, 7; Alexandria, 1. During the *three months ending September 30th*, Nice, 32; Rome, 109; Milan, 79; Turin, 4; Genoa, 16;

Bologna, 6; Livourne, 1; Padua, 2; Lisbon, 117; Buenos Ayres, 442.

From Surgeon-General Hamilton's Abstract:

Havana, during the month of January, the number of deaths registered from small-pox was 269; Cienfuegos, during the three weeks ending January 23d, 82; Guayaquil, during the two weeks ending January 14th, 40; Sagua la Grande, during the two weeks ending January 21st, 19.

LITERARY NOTICES.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES—AN ATLAS AND TEXT-BOOK COMBINED. By GEORGE HENRY FOX, A.M., M.D., Clinical Professor of Diseases of the Skin, College of Physicians and Surgeons, New York; Professor of Diseases of the Skin, Post-Graduate Medical School and Hospital, New York; Physician to the New York Skin and Cancer Hospital; Fellow of American Academy of Medicine; Member of the New York Dermatological Society, the American Dermatological Association, etc. Second series complete in twelve parts. Hand-colored plates; nearly one hundred cases from life. 4to. To be published in twelve monthly parts, $2 each. New York: E. B. Treat.

This work is already well and favorably known. But it is now eight years since the first series of plates appeared, limited to a partial illustration of the subject, with text applied to the cases illustrated only. This, "The *second* series, is a complete remodelling of the subject, in which a new and better class of illustrative cases are presented, and the total number increased fifty per cent, including several important affections, which were altogether omitted in the former work, are now beautifully illustrated, making the series as complete as possible. In place of the few pages of descriptive matter which accompanied the original plates, a notable enlargement of the text, fully one hundred per cent, is a leading feature of the present work. The diagnosis and the treatment of skin diseases are especially considered, and the text, consisting of upward of two hundred quarto pages, is designed as a complete work on

dermatology. In its present form the work appears as a combined atlas and text-book." Parts I. and II., before us, which respectively illustrate and treat of Seborrhœa, Erythema multiforme, Erythema bullosum, Varicella, and Variola; and Urticaria, Urticaria pigmentosa, Dermatitis venenata, Dermatitis calorica, and Eczema erythematosum, give evidence of fully sustaining the promise to make it a complete work on dermatology in the most comprehensive sense.

DISEASES OF THE HEART AND LUNGS. By JAMES R. LEAMING, M.D., Emeritus Professor of Diseases of the Chest and Physical Diagnosis in the New York Polyclinic; and President of the Faculty, Special Consulting Physician in Chest Diseases, St. Luke's Hospital, New York, etc.

This second edition of Dr. Leaming's excellent work (and the fifth volume of "Treat's Medical Classics") has been thoroughly revised and considerably enlarged. The author's well-known devotion to the study of the subjects of this treatise, and his acute faculty of discriminating sounds, even to the minutest details in their diagnosis, gives great weight to his judgment; while, in addition to his many years' almost exclusive attention to diseases of the chest, and his large hospital experience, he has had the best of opportunities for observing the effects of remedies, which are recorded with great particularity—qualities which should commend this work to all medical practitioners who would avail themselves of the advantages and practical experience of one of the most skilled observers and reliable authorities in the diagnosis and treatment of that class of diseases which, more than any other, requires the attention of all physicians.

LEDGER OF MONTHLY BALANCES AND INDEX OF ACCOUNTS. A companion to the "Medical World Visiting List." The *Medical World*, 1520 Chestnut Street, Philadelphia. This is a very concise and convenient "Ledger" for physicians who would avoid cumbersome account-books and waste of time in looking up accounts.

SEVEN HUNDRED ALBUM VERSES is the title of a commendable brochure of 126 pages to all who may be invited to inscribe a sentiment of affection or regard in a friend's album.

It will be sent to any address by mail, postpaid, for fifteen cents in stamps, by J. S. Ogilvie & Co., the publishers, 57 Rose Street, New York.

NERVOUSNESS: ITS NATURE, CAUSES, SYMPTOMS, AND TREATMENT. By H. S. DRAYTON, A.M., M.D. Illustrated. New York: Fowler & Wells Co. A pamphlet of 74 pages, adapted to and may be read with profit by the non-professional. But it has a little too much heredity in it to be as beneficial as it might otherwise be. "Nervous" people are not, as a rule, excusable because of their parents' or other people's sins, and are generally curable in proportion as they may be made to realize their own responsibility.

OXYGEN AS A THERAPEUTIC AGENT. By P. D. ROTHWELL, M.D., Denver, Col. This is a brochure reprint of 73 pages from the Denver *Medical Times*, which skims over a good deal that has been written of the uselessness of other remedies in the treatment of tuberculosis, with the evident purpose of exalting the oxygen treatment, fortified by the citation of a number of cases, but apparently forgetful that it is no new thing, that it was equally lauded more than twenty years ago, but not sustained by practical results.

NATURAL LAW IN THE BUSINESS WORLD. By HENRY WOOD. 12mo, pp. 222. Boston: Lee & Shepard; New York: Charles T. Dillingham. This is a valuable contribution to economic science, which should be read by all of the whilom followers of Henry George especially, and may be profitably by all persons who would familiarize themselves with sound doctrine with regard to the political and social problems which are so frequently made the bones of contention between capital and labor.

Necessity of Early Operation in Strangulated Inguinal Hernia, by Isaac N. Quimby, M.D., Jersey City, N. J., and *Nomenclature in Psychiastry.* Monomania or Oligomania, Which? Paranoia, What? By Ralph L. Parsons, M.D., Greenmont-on-the Hudson, near Sing Sing, N. Y., are both excellent contributions to the subjects respectively treated of.

THE SANITARIAN.

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THE OHIO STATE SANITARY ASSOCIATION.

PROCEEDINGS OF THE FIFTH ANNUAL MEETING HELD AT TOLEDO, FEBRUARY 9TH AND 10TH, 1888.

Professor E. T. NELSON, Ph.D., of Delaware, President.

WELCOMING ADDRESS.

By Hon. J. KENT HAMILTON, Mayor of Toledo.

Evening Session, February 9th.—On being introduced, Mayor Hamilton said in substance :

It is an old maxim, generally applied, that mankind is selfish. But there is an exception to this maxim, and that exception is the physician, who learns to take care of others, often to the neglect of himself, and who becomes so absorbed in this work that it in time grows into his very nature.

The Mayor devoted a large portion of his address to the city of Toledo, which, some years ago, he said, had a reputation for unhealthfulness, and with good reason, too, in part, for it was undoubtedly built over marshy ground. Malaria was therefore prevalent, and much sickness ensued. But the greater part of the bad reputation which Toledo acquired was due to misfortune or accident.

It was a common remark in those times for people to say that the principal road out of Toledo led to a cemetery. This

was practically true, but what are the facts? It happened that a cemetery was laid out near the principal thoroughfare leading from Ohio into Michigan, and, of course, this road was extensively travelled. Hence, while the saying conveyed an entirely erroneous idea, it was strictly true.

So it is that Toledo has in the past gained a reputation as an unhealthful city, but she is peopled with live, energetic men from New England, New York, Pennsylvania, and Ohio, and these men went to work to undo the great wrong. They filled up the holes, they built paved streets, they instituted a system of sewerage, until to-day Toledo ranks as one of the most healthful cities of its size in the world.

The Mayor complimented the sanitarians and the good work they are doing. Since he was elected Mayor he had had occasion to look over the health reports, and had become interested in the sanitary welfare of the city. He was gratified to know that there is a class of unselfish men who labor for the healthfulness of the commonwealth in which they live, and all he could say was, "Welcome, thrice welcome." As you sometimes see placarded in country stores, "If you don't see what you want, ask for it."

Professor EDWARD ORTON, LL.D., State Geologist, briefly responded to the Mayor's Address, as follows:

The State Sanitary Association was first organized and entered upon its labors five years ago. It has been doing good work since, and proposes to continue to do good work in the future. The professor detailed what this work had been and what was yet left to be done. He said that sanitation in Ohio had just commenced. The State was one of three which had been dilatory in taking action looking to the health of its subjects.

The historian of the twentieth century will have very little to say about the sanitary work done in the nineteenth century, because there is very little that can be said. The professor referred to the privileges that Toledo and the other lake cities enjoy in the way of having a depository for their sewage and garbage, and said that the great problem confronting the sanitarians to-day is what to do with the refuse, etc., in the inland cities. He concluded by thanking His Honor in behalf of the society for the hearty welcome accorded.

THE DUTY OF THE HOUR—ANNUAL ADDRESS.

By the President, E. T. NELSON, Ph.D., Professor of Physiology and Geology, Ohio Wesleyan University, Delaware.

THE wheel of the months has made its revolution, and we find ourselves again in annual session. Papers of greatest value and timeliness were read at the two former meetings of this day, and all of them were accompanied with able, spirited, and even profound discussions.

Other papers and other discussions of like character will occupy as fully the hours of to-morrow.

To-night we rest somewhat from the severer studies of the session, and, in the presence of a more popular audience, talk along lines of common interest. Before entering upon the formal duty of the evening, I must, in justice to my own feelings, return thanks for the honor conferred upon me by your suffrages as expressed at our last annual gathering. It should be considered a very high honor, indeed, to preside over the daily meetings of this body and to speak for one hour as, in some sense, the representative of the sanitarians of our noble commonwealth.

I trust our influence is not limited to the audience assembled in this hall to-night, or to the few score gentlemen who have found it possible to leave the office and study at this busy season of the year, in order to attend the annual session of this Association. We are speaking, as I dare hope, to the people of Ohio, for whose health and wealth and prosperity we are most certainly laboring. This is a time of seed-scattering. The harvest will be gathered in scores of towns and villages and in thousands of homes. With such feelings as these, gentlemen, I thank you for your kindness and your confidence.

The address of welcome by His Honor, the Mayor of the city of Toledo, to which we have just listened, should make us all

feel perfectly at home—so much so that we may now reasonably expect to see a banner similar in spirit to the one which spanned a St. Louis street during the last encampment of the Grand Army of the Republic: "Welcome, thrice welcome!"

"If you see anything you want, ask for it. If you do not see anybody to ask, take it." Brother sanitists, we shall find it a far more difficult task to take Toledo to-night than when some of those present first became acquainted with the city.

Twenty-five years ago every tenth house was a drugstore, carrying from one to several hundred weight of quinine each. Every vacant lot was a frog-pond, from whose slimy depths ear-deafening music wafted forth upon the nightly air. The entire city seemed as if planted above some deserted coal-mine, whose roof was slowly but surely caving in. The welcome of those early days, if a little *shaky*, was nevertheless so frank and generous that the most chance visitor could hardly avoid taking the best the city had to offer.

But *the* Toledo about which we heard so much even a quarter of a century ago has come, and far sooner than was then prophesied. It is already a city of 75,000 people, and has the strength of a giant. Courage, confidence, and perseverance have placed a ten-foot foundation under the entire city.

The marshes have been drained and covered with broad avenues and beautiful grounds. The frog-ponds have given way to stately churches and modern choirs. Amid all this material progress and an uninterrupted growth in population, the death-rate of Toledo has been uniformly lower than in perhaps any other city of its size in the country, and therefore in the world.

As sanitists, it is well that we meet to-night in the city of Toledo. It is well that we honor in some public way what has been accomplished for this city by her distinguished Health Officers, Drs. Van Pelt and Collamore, through the enlightened co-operation of her local Board of Health, through the skill and foresight of her physicians, and through the constant sympathy and aid of her entire citizenship. Toledo boasts of her incomparable lines of railway, which converge to this single focus the trade of the central West. Lake, river, and canal afford her remarkable water privileges, of which she

is justly proud. She has brought the "new fuel" through iron pipes a distance of more than thirty miles, thus rekindling the fires of her manufacturing interests and adding greatly to her wealth. But not one of these merited advantages, not all of them combined, augur so deserved a future for Toledo as her present sanitary condition and her phenomenally low death-rate.

Table showing the mortality of the city of Toledo for the past decade:

1878	13.14	per mille.
1879	15.46	"
1880	16.43	"
1881	17.30	"
1882	14.25	"
1883	13.24	"
1884	14.10	"
1885	13.23	"
1886	12.89	"
1887	13.64	"

The average annual mortality, as shown by these statistics, for the past ten years is 14.37; for the past five years, 13.45 per mille.

As opposed to these telling figures, I find the average annual mortality in the twenty leading cities of the United States, Toledo included, to be 20.79 per mille. The average of fourteen cities in England is 22.3; thirteen cities in the German Empire, 25; five cities in France, 26.5. The statistics are not more satisfactory when considered by States and countries.

According to the Registrar-General of England, the average annual mortality of the more important European States, taken on a twenty-five-years' basis, is as follows: England, 22.5; Prussia, 27.7; Italy, 30.1; Austria, 32. Returning to the United States, we find a mortality in Massachusetts (where the records are admittedly the most accurate), and as the average for the past twenty-five years, of 19.76, while the death-rate of the entire country has been assumed to be somewhere between 19 and 20 per mille.

All persons reported in these statistical tables are dead, but it is far from true that all the dead are reported.

Mr. E. B. Elliott, the very able statistician of the Census Bureau, estimates that forty-one per cent of the deaths which occurred during the census year of 1870 escaped enumeration.

The Ohio State Board of Health, in its first annual report, very generously adds fifty per cent to the mortality reported to the office of the Secretary of State by the judges of probate in the several counties. Fourth Ward, in the city of Delaware, cast 288 votes at the last gubernatorial election, and has a supposed population of 1500 to 2000. The assessor made oath to the judge of probate that only two deaths had occurred in the entire ward for the year ending April 1st, 1887. There were certainly not less than 25. It is to-day with me an open question whether the death-rate in the smaller towns and in the country districts, which are entirely without sanitary oversight, is not greater than in cities, with their efficient Boards of Health.

Owing to the safeguards thrown around the collection of vital statistics in all of the larger cities, the published tables of mortality must be accepted with a fair degree of confidence, while the mortality of towns and villages, and also that of the country at large, is too often estimated, and estimated on very imperfect data.

Very many of those who have honored me with their presence to-night will recall having read at some time within the past dozen years Dr. B. W. Richardson's deservedly famous address, entitled "Hygeia—a City of Health." With the skill of a masterworkman this learned sanitist laid deep the foundations of an ideal city, which was to shelter 100,000 real people.

Hygeia was to have broad acres, wide streets, and unlimited parks. The houses, separated each from the other, were to stand on arches without cellar or basement, so that sunlight and air might have room for their never-ceasing battle with filth and disease. All heavy and noise-producing traffic was to be carried on within arched subways beneath the street, out of sight and out of hearing. The system of sewerage was to be the most perfect, with arrangements for constant flushing, and also for ventilation into tall shafts by means of pneumatic engines.

Public laundries under municipal inspection; shops for workingmen and nurseries for their children; hospitals conveniently located and under strictest sanitary control; genuine homes for the aged and the infirm, for the insane and the demented; bathing establishments, gymnasia, and playgrounds —all these and more were to be provided as in no other city in all history; but throughout Hygeia there was not to be a single saloon, barroom, gaming establishment, or house of ill-repute. The material city was at last erected according to the specifications, and the people for whom it was intended moved in and took possession.

Municipal and sanitary officers were appointed and government was enforced. As a result, disease after disease vanished as if by magic. Those greatest scourges of our race—typhus and typhoid-fevers, cholera, and small-pox, and the train of affections due to alcoholism, soon became unknown except as traditions.

With prophetic insight Dr. Richardson then glanced along the record and observed that the death-rate, like the mercury in the thermometer tube, fell lower and lower, until before the end of the first generation it stood at only 8 degrees above the absolute zero of sin, filth, and misery. During the second generation, when hereditary influences were superadded to these perfect sanitary environments, the death-rate fell to five in each one thousand of the population. So much for an ideal city where all the people are wise and good, and where they all obey with cheerful alacrity the commands of God and their physicians. Throwing aside the rhetorical halo which surrounds the city of Hygeia, we learn that (in the opinion of so eminent a student as Dr. B. W. Richardson) a death-rate of 8 to the thousand is the lowest theoretical mortality in cities having perfect sanitary surroundings, an abundance of pure water, and an intelligent, cultured, and moral population.

Hygeia is a city of the millennium, and therefore beyond the province of this Association; but it will well serve our purpose in an attempt to draw some encouragement and enthusiasm from the present sanitary outlook in America.

Botanists tell us that the germination of any known variety of seed will take place amid varied environments and also under widely different temperatures, but that for each species there is a *minimum* temperature below which the unfolding of

cells and the wonderful growth of embryo and plantlet cannot take place; also a *maximum* temperature marking the limit of endurance in the opposite direction, and, somewhere between the two extremes, the *optimum*, or the temperature which is best fitted for the development of the particular species under observation. The intelligent farmer is constantly experimenting, hoping in some way to lower the optimum in order that germination and growth may progress freely during the spring rains and early summer sunshine.

In the field of vital statistics, the city of Hygeia, with its annual mortality of 8 per mille, may be taken to represent the minimum death-rate in cities of 100,000 or less, and under absolutely favorable circumstances. The typical American city, with its annual mortality of at least 20 for each thousand of its actual population, marks what we may not unreasonably call the maximum.

The best results thus far obtained, or the present optimum, must be placed at 14 per mille, or about the average mortality of the city in which we are now assembled.

The *duty* of the hour presents itself to us with loud-clanging voice, but in perfectly unmistakable language. The maximum mortality can and must be rapidly diminished, and the present optimum carried nearer and nearer the theoretical minimum. In order the more rightly to estimate this duty and the responsibility resting upon every true lover of his country, follow me as I shall wander for a very few moments longer in the field of vital statistics. The present population of the United States is certainly not less than sixty millions. Assuming the average mortality to be 20 per mille, a reduction to 14 would effect a saving of 360,000 lives annually—a population greater than that now forming the State of Rhode Island, with its varied and multiplied interests, or our Ohio chain of lake cities from Toledo to Conneaut.

A further reduction of the mortality to 8 in each thousand, or that of the ideal city Hygeia, would double the number, and give us for contemplation a population greater than that found in all those Western territories which are to-day struggling for Statehood.

Statisticians place an average valuation of $1000 upon each human life. As this estimate is made without regard to age,

sex, employment, or physical condition, it may be accepted as true from the mere commercial or national standpoint, but it is far too low when considered in the light of man's social and family relations. Even on that low basis, however, the financial loss to these United States from the 360,000 deaths which we may well term avoidable is far greater than the surplus now in the National Treasury, and which is justly exercising the wisest minds in and out of the halls of Congress. The President of the United States, in obedience to highest duty, devotes an annual message to questions growing out of this surplus, and the effect upon commerce and manufacturing interests of the withdrawal from trade of the vast funds now in the hands of the Government.

But men are more than silver dollars, and brains are our highest capital. The wealth that is annually and without necessity being locked up in the grave is as much greater than the few millions locked in the nation's vaults as day outvalues night.

Again, it has been estimated, as a result of long-continued observations, that in any community there are, at least, 20 weeks of sickness for each and every death, and that, counting the loss of wages and the increased family expenses, $15 a week would be a low money value to place upon disease.

Assuming this estimate to be worthy of acceptance, the 360,000 preventable deaths would be accompanied with 7,200,000 weeks of preventable sickness. We thus lose the services of over 7,000,000 people for one week, or of 138,000 for an entire year—a population almost twice greater than this city.

The financial loss to the nation from this avoidable sickness represents a sum one fifth greater than the income from the entire wool industry of the United States, more than twice as large as the tobacco industry, and five times that of sugar and molasses combined.

We have contemplated as yet only the annual effect of a lessened mortality, but the problem before us to-night is one of compound, not of simple interest. With decreasing mortality there comes increasing longevity. The mean duration of life is now about 41 years. With a mortality of 15 per mille, it would be raised to 54 years; of 14, to 57 years; of 12, to 65 years; of 11, to 70 years; while a mortality of 8 in the thou-

sand, as found by Dr. Richardson at Hygeia, would lengthen the average duration of life to 93 years. If we could reduce a nation's mortality from 20 to 14, we should add an average of 16 years to the life of every inhabitant. Think of the possibilities wrapt up in 16 years, coming as they do after one has reached the full maturity of his powers!

Theoretically, the average citizen of our country dies upon his forty-first birthday.

Sanitary science, though as yet hardly more than a jumble of unproved hypotheses, is able to offer 16 additional years, covering the decade and a half of life's greatest strength and greatest usefulness.

Thus far in this address I have felt it proper to dwell upon the problems with which, as sanitists, we have to deal; to magnify the family, the social, and the financial aspects of these questions, and to emphasize as strongly as possible their political and civil import. Man's true responsibility is always born of knowledge. The battle against filth and the filth diseases would be well in hand if only the people could be made to know the existence of the conflict.

In contemplating the duty of the hour—namely, to lower the annual mortality in city, State, and country, we have this thought both for consolation and reproach—*it is a possibility.*

We need but turn to some of the great cities of the Old World and run our eyes up and down the columns of statistics to ascertain that the modern revival of sanitary science has already lowered the death-rate by twenty-five or thirty-three per cent, while in a few especially favored communities, the saving of life has been over fifty per cent. Throughout the United States the success has been no less remarkable. Not a single instance can be cited in which the creation of a Board of Health, fortified with ample powers, has not been followed by an immediate lowering of the former annual mortality. A reduction of the death-rate in every city of our country from 20 to 18, or even to 15 per mille, is possible, and that before the close of the present decade.

In a matter so serious as this, what is possible becomes an imperative duty. It were cowardly to think or write otherwise.

It remains to speak of the remedy.

How is this exhausting mortality, this appalling waste of human life, to be prevented?

How is the pestilence that walketh in darkness to be stayed in its course? Your answering thought outruns my feeble words. By united, intelligent, conscientious, persistent, and never-ceasing efforts on the part of every physician, teacher, and student of sanitary science. This is a platform broad enough to receive and welcome every person who honestly desires to elevate his fellow-man—a platform upon which empire may unite with nation, nation with State, State with city, and city with individual.

It is a platform upon which Church and State and school may meet in a friendly congress and deliberate for the universal good, but all too narrow for dissensions and personal jealousy, whether between individuals or organizations.

We desire to name a few of the more important planks in this platform, every one of which deserves fuller treatment than is possible to-night.

1. A National Quarantine law is imperatively demanded.

Cholera threatens us from Europe, from Japan and China, and from Peru. Yellow-fever is a constant menace, and has already made a lodgment on the soil of a sister commonwealth. East, West, and South—our entire coast lines—lie open to these subtile invaders.

Quarantine in some one of its protean forms, but under State or local control, is, indeed, enforced at all the more important ports of entry, but without harmony of method or unity of action, disease-laden ships being confessedly admitted into one port after having been refused admittance into another. The present methods are freely and openly condemned by the local Boards of Health in our several cities, and by all who have had opportunity for careful investigation. Meanwhile, even this modicum of efficiency is in danger of being lost through political jealousy and party strifes.

What more sad, nay, disgusting spectacle is now before the public than the political squabble over the health office and quarantine in New York!

The governor of the State vetoes measure after measure which are intended to promote the efficiency of the service, seemingly because they may bring honor to another political party.

And to-day a man is being pushed for the greatest office within the gift of the State—that of Health Officer of the Port of New York—whose highest recommendation is that he always votes a certain ticket, just as if bacteria and microbes stood in a little greater awe of a Democrat than of a Republican or a Prohibitionist.

Ohio is only slightly less concerned about the success of quarantine at Philadelphia, New Orleans, or San Francisco, than the citizens of Pennsylvania, Louisiana, and California.

The great arteries of commerce lead through the State.

Thousands of foreign immigrants annually settle within her domains, and other thousands of her citizens travel abroad.

Ordinary justice, therefore, demands that the State of Ohio should in some way bear an equitable share of the expense of examination and quarantine. What is thus found to be true for Ohio is true for every other State and municipality in the Union.

The passage of the Inter-State Commerce Law by the ardent labors and hearty support of eminent men in all political parties proves that there are questions which belong not to one State, but to all States; not to one section of country, but to all sections.

Such a question is *National Quarantine.* The just enforcement of such a law is demanded by every consideration of humanity, and is opposed by no true interest of our country.

2. Very much if not all that has been said about quarantine will apply with equal force to the National Board of Health.

It was created to investigate disease, especially that of a contagious or infectious character, and "to determine the presence or the absence of the causes of disease, and further to secure the removal of such causes." Such investigations require extensive laboratories and museums, ample libraries, special training, and resources far beyond those of the individual or even the State.

To be successful they must be continued without interruption through a term of years and be prosecuted, if need be, in foreign lands and under a foreign flag. Most naturally, then, they fall within the province of the national Government rather than that of any single State. Investigations of the

most profound moment to every citizen of our country were undertaken, and the brief reports received led us to hope for very important results in the not distant future, but the Congress of the nation throttled the work through failure to continue the necessary appropriations.

The National Board of Health was in position to solve many of the great sanitary problems of the age, and to materially lower the alarming mortality of our country.

3. A uniform law of vaccination should be passed, and its enforcement made compulsory throughout the United States and Territories.

Small-pox is the *one* disease in the entire catalogue whose repression is absolutely within man's power. To give it further lease of life within our borders is to admit an indifference which amounts to criminal carelessness. A death from small-pox can be charged neither to ignorance nor to the providence of God.

Yet the disease has recently been declared epidemic in San Francisco, ten deaths having occurred from this cause alone during the month of December. It is probably not entirely absent to-day from a single State in the Union, and must be regarded as endemic in the Dominion of Canada. The terrible epidemic of small-pox at Montreal in 1885, when over 2800 deaths occurred, will not soon be forgotten. But we must not overlook the fact that more money was expended by the United States in quarantining the Northern border and in the payment of inspection at exposed points than would have been required to vaccinate every man, woman, and child in Montreal and all of its outlying villages.

The one example of Zurich, in Switzerland, should be sufficient to settle forever all doubts as to the efficacy of vaccination, and should at the same time bury the anti-vaccinationists in a bottomless grave. With a compulsory law in force, small-pox was wholly prevented. In less than three years after the repeal of the law, the deaths from this disease were 85 in each 1000 deaths from all causes.

These considerations lead directly to the inquiry whether the time has not fully arrived for the establishment of a Bureau of Health in connection with the Department of the Interior at Washington?—a Bureau at least equal in rank and

permanence to the Bureau of Education or that of Animal Industry.

It will be remembered that several bills on this general subject were introduced into the last Congress by eminent Senators, but they failed to obtain the approval of committee, and were never brought up for passage. It is impossible to resist the conclusion, however, that the composition of at least one of the bills was dictated by hostility to the National Board of Health rather than by the demands of sound hygiene, and the utter failure of all these attempts at progress was undoubtedly due to a supposed antagonism between various interests. The establishment of a Bureau of Health on a permanent and ample basis is of too momentous consequence to the people of this country to be allowed to fall between two stools. It certainly will be created in the not distant future, and will at once become the Mecca toward which we shall all gladly turn for whatever is wisest and best in sanitary reform ; and we need not now give ourselves a moment's anxious thought as to how the several interests of quarantine, National Board of Health, consular reports, and the vital statistics of the decennial census are to be fully harmonized.

There is wisdom enough in the counsels of the nation to bring order out of that chaos.

Meanwhile, and, indeed, after the establishment of such a bureau we must foster all those private and voluntary organizations, like the Public Health Association and the one under whose auspices we are assembled to-night. They were the pioneers in this good cause, and have clearly the right of way.

The Bureau may create information, but it will ever devolve upon these larger and more popular bodies to disseminate the truth among the people. The Bureau may be the spring from which waters will flow to irrigate every field in our broad land, but not until the canals and cross furroughs have been constructed by the loyal thousands of our own people.

As to State and local Boards of Health and Health Officers, it is not necessary that I should speak at length.

Their duties are so obvious and their mission to the people so direct that any discussion would prove commonplace.

They are the final arbitrators of all these vital questions, and

the great problem of lowering the death-rate of State, county, and town devolves especially upon them.

In our late war the generals might have planned the campaigns, but the private soldiers fought all the battles and gained all the victories. The hundreds of noble men who have accepted the trying position of health officer frequently, without the slightest compensation and never with a too liberal allowance, are doing more to save life and thus reduce our nation's mortality than all the multiplied resources of the National and State governments. And thus will it ever be.

I trust it will not be out of place in this direct connection to call your attention to a bill "to *establish Local Boards of Health*," which is now before the Legislature of our State.

It changes the permissive of the present law to the compulsory—the *may* to the *shall*—and thus creates a local board in every incorporated town and village. Many of our sister commonwealths already have county supervision in addition to the local board in every city and in all of the larger towns. This is notably true for Tennessee, which since its terrible ordeal of yellow-fever at Memphis and elsewhere is fast taking front rank in all matters of health and sanitary progress.

The bill under consideration makes no change whatever in the composition or working of the present law, but in a spirit of love and charity extends all the benefits of a local Board of Health to those communities which thus far have not had sufficient public spirit to do the work for themselves. The fact that any town is without direct sanitary oversight is a perfectly convincing argument that it is in an unsanitary condition. Is it too much to ask of this body that our personal influence be exerted to secure the passage of so desirable a measure?* National, State, and local Boards of Health may do much to advance the principles of hygiene; sanitary associations may aid in scattering the seed abroad; but all true sanitary reform is a matter of personal education, and our appeals must be made at last to the family and the individual. To convince a single person that a given disease is avoidable may save a human life, while to convince him that the disease is contagious may perhaps prevent an epidemic.

* The bill has passed both houses of the Ohio Legislature on an almost unanimous vote.

To convince the people of a State that such are the facts means a lowering of the annual mortality by numbers which are but little short of the miraculous. Our true work is to accomplish these results in the shortest possible time.

To this end we must make use of every expedient and force our way into every half-opened door.

Within the present year Ohio is to celebrate, in a becoming manner, her first centennial. At Marietta, at Cincinnati, and at Columbus extensive preparations are in progress for holding exhibitions of our varied resources and of our developments in the arts, in education, and in science. Two of these exhibitions are of a somewhat local character, but the one at Columbus is directly under the authority and control of the State. Certainly not during the century has there been such an opportunity for the presentation, before the thousands of our people who might not be reached in any other way, of what is latest and most worthy of consideration in the sanitary world—the good and the bad in plumbing and in water service; in sewers and in drainage; in the disposal of garbage and excreta; in cremation and in the care of cemeteries for the dead; in cooking-ranges and appliances and in foods and drinks; in medicines, in sanitation, and in hospitals; in architecture and in the hygiene of home and school; and in whatsoever tends to bring health and prosperity to the people of our State. Fortunately, the machinery for such a health exhibition is already in operation. The Department of Education, under which this matter would probably fall as a sub-section, has been placed in charge of a worthy past President, Dr. Edward Orton.

If these suggestions meet with the favor of this Association, the whole subject should be presented promptly and properly before the Board of Centennial Directors for their immediate consideration.*

Now, Mr. Chairman, ladies, and gentlemen, in concluding this somewhat lengthy address, I desire to return my warmest thanks for the candid hearing and patient attention which has been accorded me.

I accept them with gratitude, not for myself, but for the

* A resolution on the above subject was unanimously adopted by the Association and sent to the Centennial Directors for their consideration.

cause in which we are engaged. It was my pleasure not long since to hold for a few moments a large gold medal which had been voted by the Congress of the United States to an humble sailor on the shores of Lake Erie, who had been instrumental in saving a human life. The owner's face was all aglow with conscious pride as he recounted his deed of heroism performed when a great storm was sweeping across the waters of the lake. The same feelings animated every muscle of his body as he paced up and down the narrow quarters of a life-saving station. With eye alert for signals of distress, he seemed to be constantly saying, "I have done it once, I can do it again."

Brother sanitists, we, too, belong to the life-saving service of our country, and though the Congress of the nation may not vote us a golden medal, we have our full reward in a conscious duty well performed.

SANITATION IN ARCHITECTURE.

By D. L. Stine, Esq., Toledo.

PARAMOUNT to everything else, good health is essential to happiness; and from the fact that two thirds of our lives are spent within doors, it is important that every care be taken in the arrangement and construction of our buildings, to render them free from possible dangers to health. Our habits and modes of living create the necessities in domestic architecture, and in providing for these necessities, none demand a greater amount of study than those relating to their sanitary arrangement. In the effort to do justice to the subject of this paper, we shall, for obvious reasons, confine ourselves to the practical or applied portion of sanitary knowledge, and will draw the line between the various causes of disease in our homes, and the methods at present in use for counteracting them; and aside from the subjects of light, heat, and air, important sanitary factors, we shall direct our attention to that particu-

lar branch of sanitary work which relates to water-supply and drainage; and if we but point out some of the evils, and do not suggest a remedy, the hint may strike some brighter mind, and lead to the ultimate solution of some very difficult problems in "Sanitation in Architecture."

One of the chief things to be considered is the disposal of the soil and wastes of the house, without offence to ourselves or neighbors. The plumbing of the house is the first thing attacked when disease makes its appearance, and usually with good reason. It is almost the universal custom nowadays, especially so in our large cities, to have even moderate priced cottages fitted up with hot and cold water service, a water-closet, and bath. And hand-in-hand with these indoor conveniences so valuable to the feeble or invalid, comes drainage and the danger of deadly sewer gas. We believe it is possible to so place the fixtures as to render them absolutely safe. But how many are so placed, we will not undertake to state. There are three principal causes for failure in this respect:

First. Want of proper designing in the beginning, either from ignorance or carelessness.

Second. Imperfect workmanship.

Third. The cost.

In the first place, the fault lies wholly with the architect, for he should be able to properly design the work. In the second place, with the builder contractor, who should be able to execute it, and in the third, with the owner himself, who from mercenary motives will tolerate cheap and imperfect work. Careless architects sometimes overlook the importance of the plumber's work, and are apt to go on through force of habit, and specify errors from year to year, and never know the difference until disease of some kind points to the plumbing as the source.

We must fight Nature with her own weapons, and with one or two exceptions water is the article used as a barrier to prevent the entrance of sewer gas into our houses through the pipes. Water is also the common carrier, by means of which the excreta and other refuse is carried into our sewers. It leaves the matter in much the same state as it receives it, and, we believe, exerts no disinfecting power. Water used in this way is by no means a modern idea.

A successful closet must be nearly automatic in its action; it should have no hidden chambers in direct connection with the bowl, that are liable to collect particles of filth which may in time generate foul and dangerous gases to be thrown off into the room. It should be so connected that no possible back pressure can be exerted from the sewer that would be likely to deprive the traps of their water seal. In other words, the soil pipe should be open to the outer air at both ends. A constant circulation of out-door air can thus be maintained at all times. The method of connections should apply to every fixture in the house. The present custom of boldly exposing every pipe trap and bowl to full view is one step far in advance of the old method of closing everything in the neatest of wood-work, so that none of the piping was visible, and after the work was finished no one knew what was behind it. Otherwise it is a receptacle for dirt and often the dried results of an overflow of filthy water, and a general cloak for carelessness and neglect, and in time becomes a veritable pest spot; disease follows. The physician points to the plumber. An expert is called in, an investigation takes place, and a woful state of things discovered. Possibly no traps under any of the fixtures, and if they are there, they are so connected as to be deprived of their water seal through siphonage three fourths of the time, or so bunglingly put in as to provide an avenue rather than a preventative.

Safety and immunity from trouble of this kind can only be had by the use of brains and common-sense in the beginning, and watching the workmen who are charged with the execution of the plan; and we cannot hope for success if, after the entire system is finished and in use, it is not properly taken care of and managed with intelligence.

A constant vigilance is necessary to keep a system of piping in working order, and every physician knows it is useless to prescribe medicines if the patient will not follow his advice. So it is with any system of sanitary appliances. They may be properly arranged in the beginning, but neglect and abuse will surely destroy their efficiency. The rigor of our climate demands that our houses be closed against the weather, compelling us to warm the air for breathing artificially before introducing it into our rooms; and because of an inefficient

apparatus, the out-door air is shut off and the supply taken from the cellar, which is often found damp, mouldy, and filled with all sorts of rubbish and decaying vegetable matter; which reminds us of a prescription once given to a man (so the story goes), as follows. He had applied to the doctor for advice, and after showing him the premises, the doctor wrote:

Rake and broom, 1; shovel, 1; wheelbarrow, 1. Sig. Use vigorously every twenty-four hours until relieved; sunshine will do the rest.

Hence, in building, professional advice should be first obtained, and the work entrusted to honest and competent mechanics, and then remember that "cleanliness is next to godliness," and is only secured by strict methods. Even when houses stand isolated the owner cannot neglect his own household; for it might be shown upon examination ofttimes that the architect and plumber are not to blame.

THE DISCUSSIONS.

Dr. Ashmun opened the discussion on Mr. Stine's paper, which he declared was conspicuous for the matters of which it did not treat. One of the most important of these was the failure to provide for the ground air. Houses were too often constructed without any reference to provisions against this air. He had occasion within the last year to visit several houses where a space of several inches was left under the floor without an outlet for the escape of the confined air. This air he regarded quite as dangerous as sewer gas.

Another matter untouched by the paper was a method for getting rid of air in a room. One of the worst enemies of man is his breath, and it is often the case that a whole family will be cooped up in a house without ventilation, where they breathe the air over and over again until it is laden with poison.

Dr. R. Harvey Reed said that architects as a class fail to look after the most important part of a building. They look after the general appearance of the building, and give a great deal of time to the exterior, but they absolutely fail to provide proper ventilation.

HOW FAR HAS THE SCIENCE OF VENTILATION ADVANCED?

By ISAAC S. SMEAD, Esq., Toledo.

IN an attempt to answer the question, "How far has the science of ventilation advanced?" I can only be guided by such information as I have secured through practical rather than theoretical experience.

For almost twenty years I have been engaged in the business of manufacturing apparatus that we have advertised as suitable for the warming and ventilating of buildings. I have furnished more public buildings with warming and ventilating apparatus than any five men in either America or Europe; and it is, perhaps, for this reason that I have been called upon many times either "to read a paper" or to "make a few remarks" upon occasions like this.

There are two very good reasons why I have always heretofore refused to do so:

First. Because of a consciousness of the fact that I do not possess the scholarly attainments that would permit any effort of mine to stand favorably alongside the well-worded essays which are furnished by those who have been more fortunate in early life, and who can clothe their beautiful *theories* in a more polished manner than one can who possesses no diploma as a guarantee that he is competent to advance a theory or to state a *fact* publicly.

Second. Even if I could with some degree of success compete with the essayist, it has always seemed to me that any effort in this direction would appear to many, if not to all, to be an attempt to advertise my business in other than the legitimate channels.

If, in accepting the invitation extended by several members of this Association, I overstep the bounds of propriety and advertise the apparatus I manufacture, or if I should fail to interest, I trust you will pardon me. And if I do not say

anything that will *instruct*, I hope I may, at least, amuse and not *offend*.

For twenty years I have done what I could to advance the interests of sanitary science so far as the questions of warming and ventilating are concerned, not with a desire to pose as a *reformer*, but for the especial purpose of increasing my bank account; and believing that that could be most surely done by manufacturing the best apparatus, I have tried to do so, and by reading all that has been written upon the subject that I have been able to procure, I have become somewhat familiar with apparatus manufactured in this and other countries for the purposes in question.

During the past ten years very much has been printed, and I can assure you that I have read a large amount of *trash*. It is one thing to sit in a library or office and theorize and write, and quite another to say to a Board of Education, as a manufacturer is obliged to do, that he will, say for $2000, manufacture and put into a school building an apparatus to be cared for by a janitor paid the enormous sum of $30 per month. It is often the case that trustees who employ janitors to care for $40,000 worth of school property pay more for, and with greater care examine into the capability of, the men whom they engage to milk their cows and feed their pigs.

The manufacturer must say to the Board that, under such conditions, he will furnish an apparatus which, with less fuel than some other is said to require, will thoroughly warm the air and ventilate a building containing from five to nine hundred children—though many of them in their persons and clothing are so unclean that scrub-brush and soap, aided by "musk," "rose geranium," "Oil of Roses," "Edenia," or "Cashmere Bouquet" would fail to "down" the original smell.

He must say to them that, no matter how careless or how foolish the janitor may be, the temperature of the school-room will always be like a June morning, and the air as pure and balmy as we are *told* California is; that the apparatus will burn soft coal, hard coal, coke, wood, peat, or any other combustible thing, no matter what the quality, that economical trustees may purchase or a rascally contractor furnish. And especially must he guarantee that but *little* of anything be required. He must also guarantee that the apparatus will

never wear out; at any rate, not during their term of office—and they seldom resign and always hope for a re-election.

He must do all of this, and wait until the Board "have tested the apparatus" before he gets his pay. And it is sometimes the case that those who finally act as judges and decide the question know no more about the subject of ventilation or the real merits of warming machinery than I do concerning the whereabouts of Charlie Ross. Now, if there is anything that will cause the average American to "hump himself," it is the hope of financial reward; and I do not hesitate to say that it has been with an eye on a dollar at the other end of the line that has caused me to work as many years as I have, and spend money unsparingly to meet all *reasonable* requirements that doctors, sanitary writers, theorists, or customers have demanded.

With several hundreds of buildings to experiment with—yes, experiment, that is the right word—I have gained some *experience* that but few of those who "read papers" at conventions, write books, essays, or newspaper articles, know anything about. There is such a thing, I believe, as the science of ventilation; and so there is, I am told, of medicine. But how to apply the science of either is a question that can only be learned well by practical experience; and when I say I would as soon think of calling on the superintendent of schools instead of a physician to prescribe for a sick child, simply because the superintendent knows something about books, as to call upon a writer to tell me how to warm and ventilate my house, do not misunderstand me and conclude that I especially desire to advertise my engineering ability or to attack all who write. I wish rather to call your attention to the fact that experience is valuable in any line, and absolutely necessary in a business where the plan can seldom be duplicated, because it is very unusual that we find two buildings exactly alike any more than we find two writers to agree upon the subjects they discuss. Their information is limited by their limited experience. Yet they often assume to criticise severely, and it is with a considerable degree of pleasure that I improve this opportunity to get even with some who have taken advantage of similar opportunities to attack engineers and complain of their work.

One writer tells us that the air should contain but little

moisture; another says it should contain more. One writer says that it should enter the room at the ceiling; another, at the floor; and another, to avoid the mistake of either, I suppose, says it should come into the room half way between ceiling and floor.

One writer says the exit should be at the ceiling; another, at the floor; and another, desiring, I suppose, to dodge them both, says it should be half way between the two. One writer says moisture should be added *after* the air is warmed; another says it should be added *before* the air is warmed; and another, that no water should be added at any time.

One writer tells us that "air should be warmed by passing over a warming surface of cast iron;" another says "wrought iron only should be used;" and to avoid the error of the other two, a third claims that "a warming surface of clay will correct all evils."

One writer tells us that "hot-air furnaces are failures, and steam-heating is perfect;" another says that "steam-heating is a costly experiment, and it is the better way to depend upon the old-fashioned fireplace;" and that "the direct rays of heat," coming, I suppose, *direct* from the fire, will then go *direct* to the spot to which they should be *directed.*

One writer tells us that the fresh-air ducts should commence away up in the heavens somewhere; that "then only will the pure air go into a building;" another calls attention to the fact that if such is the case, the Lord should have permitted the people to grow not less than forty feet high instead of from four to six.

One writer tells us that "ventilation can be secured only by the use of a fan or a mechanical system;" another, that "the natural system is the only one that should be considered." One doctor tell us that "the air is full of dangerous bacteria;" and another says that "bacteria are not dangerous;" and a third swings his pen to say "they are dangerous only under certain conditions;" and then most of the other doctors commence quarrelling in trying to decide what those conditions are.

One writer has truly said, "Sanitary science has worked much good, but it has disseminated a vast amount of nonsense. Now it is the manufactured article which is big with

the germs of death; now the water; now the air; and now the milk. If half that has ever been written upon these subjects were the truth, there would be no further need for agitation. All the people would have been dead long ago. The theory that everything known is full of the germs of fatality seems incompatible with the fact that people still continue to live."

I could mention a hundred more similar contradictions from the books and essays I have read. Do any of these writers and talkers ever manufacture a warming and ventilating apparatus, and with their own money set it in operation, and guarantee its success under the forfeiture of from one to twenty thousand dollars? Do they know very much about the practical questions an engineer has to pass upon? I have never known of many who could earn forty dollars per month in an office or factory. Now I would rather have a surgeon who has had practical experience in surgery amputate my limb than one who has only read "The Science of Surgery," even if he could furnish me with a beautifully written essay upon the subject. I am not going to theorize at all. I am not going to tell you anything about bacteria, about the air, its component parts, its weight, the amount of moisture absolutely necessary, the exact distance from the earth the air should be taken, the exact number of cubic feet of air a child or an adult will vitiate in an hour, for I do not know. But I can assure you, and without any hesitation, that there are very many more questions that I cannot answer than there are that I can. I have made a great many mistakes in attempts to properly warm and ventilate buildings, and sometimes have made the same error more than once; but some of the most expensive errors I have ever made—expensive to my customers as well as to myself—were caused by following the advice of those without practical experience, but who would quickly answer any of the questions I have here mentioned.

Of course I am willing to admit that it is reasonable that a demand be made for ventilated buildings, and in answer to the question, "How far has the science of ventilation advanced?" I assert that the demand has been met, and fully met, and that there are in this country hundreds and hundreds of public buildings that reflect great credit upon the

engineers who have patiently and skilfully applied the real and true science of ventilation to the designs from which the buildings were erected. And it annoys me exceedingly to read, as we all of us have read, that although the nineteenth century has railroads, telegraphs, telephones, electric lights, and a thousand other valuable inventions, yet one writer says, "No one has yet invented a system of ventilation." No one has or ever will *invent* a system of ventilation. That was done long ago by the One who made all things; but how to apply properly the natural laws to each particular building is the question the engineer, not the theorist, must pass upon; and there are in the United States a score or more of engineers whose record in this line will entitle them to just as high a position in this profession as has been reached by men in any other profession, and their services, like those in other professions, are on the market, and can be secured if people are willing to pay a decent price for first-class work.

If all or one half the questions that an engineer has to decide in preparing plans for a building were thoroughly understood, the criticisms would be much less severe. It is reasonable to expect substantially as follows:

First. That the apparatus be reasonable in its cost.

Second. That it will consume the kind of fuel cheapest in the district in which it is to be used.

Third. That the apparatus be easily managed.

Fourth. That it shall be so constructed and so located in the building that no heat generated by the fuel consumed is lost.

Fifth. That, with a reasonable amount of carelessness and neglect, the apparatus shall be durable.

Sixth. Easily repaired if broken.

Seventh. Almost automatic in its operation.

Eighth. Absolutely free from danger either by fire or by explosion.

Ninth. That it shall take the air from that portion of space occupied by the inhabitants of the earth, and send it into the building uninjured by overheating.

Tenth. The building should be so arranged that at the will of the teacher (if a school building) air at any temperature desired can be secured with little effort.

Eleventh. So arranged as to avoid local or unpleasant currents of air.

Twelfth. So arranged that the temperature will be uniform.

Thirteenth. So arranged that the floor will be warmed and an unequal temperature between head and feet avoided.

Now, these are a "baker's dozen" of specifications, and I believe that no reasonable person will ask for many more. There are in this city over twenty school buildings in which nearly all these specifications are filled to the letter, and some buildings wherein all are to be found. And as I have said to the Chairman of this Association, I was not going to theorize or try to impose upon you a scientific essay, but rather call your attention to the practical side of the question, I will ask you to come after adjournment to one of the buildings referred to and see for yourselves whether the statements are true or not. If in your opinion they are not, I hope you will not hesitate to say so. If they are true, will you not lend me your assistance in suppressing the friends who declare that "no one has yet solved the problem?" And while we are about that business, let us also include those who always write and advise, but never *do* anything else.

One of the most discouraging things that a manufacturer has to contend with, and especially if he possesses any inventive ability and is honest and conscientious and does attain step by step to a position far in advance of all others who have walked that way, is to find his path blocked by some crank who can swing a pen or command the space in "the people's column" in a newspaper; there are some people who believe everything they read, and especially if printed in the paper for which they subscribe, and the paper agrees with them in politics. It is sometimes very discouraging to know that one's financial or professional interests can be seriously injured by the foolish chatter of some one who can talk, or through the columns of a newspaper—and possibly a paper whose representative has come to you and made the statement that for $—— he will favor the action of the city officials in their attempt to improve the sanitary condition of a public building; and that without the sum named he "will write the other way," and for the next few months see your name mentioned as the one who by "ways that are dark,"

etc., has deceived the officials and "is robbing the poor tax-payers," and that they propose to stand as did the knights of old with spear and shield ready to defend the Treasury from the invader.

In doing what I have to advance the interests of sanitary science to a position where I can boldly say to you that it has gone as far as it needs to go for the present, I have at times been bitterly opposed by all classes and all professions except *one;* and that one exception is from the very men whose financial interests are the most involved by its success—namely, the physicians. They are the one class who have always been ready to extend a helping hand to work in season and out of season to induce the people, and especially the city officials, to do the very thing that is sure to cut down their revenues.

The ventilation of the twenty-one school buildings in this city has very largely increased the school attendance and decreased the visits of the doctors among the children; and yet the very best friends we have are those who, as before stated, if only actuated by selfish motives, would oppose us the most. And I am glad of the opportunity to extend the thanks of my associates and myself for the aid and encouragement we have received from the medical profession; for no matter to what school of medicine they belong, they always recommend fresh air in regular old-fashioned allopathic doses; and I cannot but conclude they are the most unselfish men it has been my fortune to meet, and, with the exception of ourselves, they are the ones most responsible for the general introduction of our system of ventilation.

HYGIENE OF THE SICK-ROOM.

By F. C. Larimore, M.D., Mt. Vernon.

It has occurred to me that, as physicians and surgeons, we do not look after the hygiene of our sick-rooms, and that failure in the treatment of our patients is the result of such

neglect. Less than two years since a case in point made a lasting impression on my mind.

A married daughter of a wealthy farmer had pelvic cellulitis. At one time a laparotomy was contemplated, and, with this end in view, the house was set in order. In the performance of this duty the cellar of this model country home was found to contain all kinds of vegetables, such as are grown in this climate, including wagon-loads of Yankee pumpkins.

This cellar extended, as all cellars should, under the entire house. It was well filled, and utilized as a storage room for all vegetables liable to be injured by frost. Some of these were in a bad state of decomposition, giving rise to foul and poisonous gases, which readily found their way to the rooms above. Everything was cleaned out, and the cellar aired and limed.

Duty called me to the kitchen for some hot water; what should confront me but a forty-gallon swill barrel half full of slop not more than five feet from the stove! Up to this time I had been eating and sleeping in this house. It is needless to say that my own health and life became now a matter of concern along with that of my patient. How to get that barrel out of that kitchen without offending my friends became a problem which was never solved. In the mean time, a favorable change rendered an operation unnecessary, and relieved my troubled mind in more ways than one. While this is an isolated case, many more could be mentioned where the unhygienic condition of the sick-room was equally as bad. This also suggests that our attention should not be confined to the sick-room *per se*, but should be directed beyond its floor and walls for possible sources of dangerous emanations. A good physician will be careful in the selection of his remedies, and administer them in a palatable form. A good surgeon will look for the best instruments and surgical dressings, both having in view the surest known means for the cure and healing of their patients. These means can be made more certain and efficient by attention to the hygienic surroundings. In a very few words you will permit me to state how a good hygienic sick-room can be secured. Where a long sickness is expected or a surgical operation to be performed of such importance as to confine the patient to bed for some time, the

best room in the house should be selected. It should have provision for an open fire, which alone will ensure good ventilation.

Carpets and window-curtains should be removed, together with all superfluous clothing and furniture. The room should be made scrupulously clean, and, if still greater precaution is deemed necessary, fumigated with sulphur. This is to be done by burning the sulphur in an iron crucible placed in the centre of the room, and near the ceiling. Druggets can be used to lessen noise and protect the feet of attendants. Such bed and bedding should be chosen as best suited to the case. The patient should be placed between sheets, one of which is to be changed every twenty-four hours. A third sheet will often be found indispensable, called the slip sheet. Fold a sheet four square, place its long diameter across the bed under the hips of patient. This folded sheet will protect the bed in case of involuntary evacuation from the bladder or rectum, and by its aid the patient can be rolled over without any exertion of his own, and thus secure a change of position so often required to prevent congestion of the lungs. To secure greater protection of the bed from escaping secretions, a rubber cloth should be placed under the slip sheet. A disinfecting solution should be kept in the bed-pan, and into it the discharges passed. Need I add, these secretions should be removed from the room as soon as possible, and not stuck away in a closet, in the wash-stand, or under the bed. It is clearly implied from the foregoing in regard to the care of the bed, that the patient's body should be kept clean by local or general sponging with soap and water. All liquid medicines should be dispensed in bottles and corked, and not left in tumblers or teacups to be taken by mistake or gather up floating particles of dust in the room. Absorbent cotton should be kept in a box or bottle. A one to twenty solution of carbolic acid, in a quart-glass fruit-jar, should be kept on hand to disinfect surgical instruments. Wash-stand cover, towels, and vessels should be clean. *The physician should be clean himself, and never touch his patient with a foul finger or instrument.* The most convenient article for disinfecting the hands is sublimate soap, one half per cent, manufactured by Stiefle in Germany and sold in this country by Schieffelin & Co., New York.

Every physician and surgeon should carry this soap with him, and use it when occasion requires. If either is to be left behind, far better for the patient that the buggy case should be neglected than the soap.

If one will practise what is here preached in the sick-room, he will furnish a good object lesson to the patient and nurse, and encourage them to be cleanly, too.

If, in addition to these directions about the room, the patient, and yourself, you will glance beyond and remove all sources of impure drinking-water or food, and see to it that pure air shall enter the room, your patient will then be placed in the most favorable condition that hygiene can furnish him for recovery.

This very brief paper is from the standpoint of a surgeon, and may be regarded as only another plea for cleanliness.

It is confined to the homes as we now find them in the country and towns, where there is no plumbing.

CHILDREN'S HOMES AND ORPHAN ASYLUMS.

By F. H. DARBY, M.D., Secretary of the Board of Visitors to the Warren County Charitable and Correctional Institutions, Morrow.

THE men and women of to-day are, to a great extent, whatever their early training and subsequent teaching has made them. Infants and children are more helpless than the young of lower animals. Paternal care or its equivalent is for many years imperative. Not only must the physical wants be supplied, but a proper direction must be given the religious, moral, social, and intellectual nature—

"As the twig is bent, the tree's inclined."

The great *desiderata* of child-life is maintenance and education—education in its broadest sense. An education that shall be not only a putting in, but a drawing out; a development and cultivation of the very best type of manhood attainable. Educational pursuits, the kindergarten, the family readings and teachings and common-school studies and exercises, are the child's best and most profitable employment. To realize

their full benefit, the fostering care and influence of the family circle is indispensable. A well-appointed home, surrounded with peace and plenty, presided over by parents with a proper conception of duty, wields a boundless influence for good over the young, shielding them from the demoralizing effects of want and degradation. Such an arrangement is a most wise dispensation of Providence, and as such must ever be kept in view as our ideal of the very best place for children.

It has been pertly said "that for every *homeless child* there is a *childless home.*" To find such and match them is a very important work of charity and reform. Where it can be accomplished it is the best solution of the problem—much better than an institution; beyond certain narrow limits, in a limited number of cases, institutional life is bad, and ought always, if possible, to be avoided. Were all our destitute children in good health, of a proper age, and of good habits, they might be rapidly and satisfactorily disposed of by indenture and adoption; but since the reverse obtains, there must be provision made to meet emergencies. Hence the necessity of what is known in our State as children's homes, elsewhere as reformatories, orphans' asylums, etc. These institutions differ in their mission from every other. In a certain sense they are custodial, yet they are not asylums. Supported by public and private charity, and having in charge the children of the poor, yet we cannot call them almshouses or poor-houses. Some who are admitted may be reformed, yet the term reformatory is inappropriate. They *are* temporarily *a home*, a miniature training-school; permanently, *an agency*—a headquarters for bettering a dependent class. Their field of work being so varied ought to at once convince any student of the subject of its great importance.

The general public in many parts of our State regard the children's home as a miniature poor-house for which a scant supply of bare necessities is good enough. Others quarter these little innocents in some old building on the infirmary farm, and a few counties, we are informed, are so benighted and oblivious to all feelings of humanity and common decency as to promiscuously mix men, women, and children in one building as common paupers. The law should be amended. (See O. L., vol. 80, p. 102.)

OHIO LAWS.

AN ACT

To amend Section 2 of an act passed April 9th, 1883, entitled an "act to provide for the protection of children" (O. L., vol. 80, p. 102).

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That section two of the aforesaid act be amended to read as follows:

Child not to be kept in infirmary unless separated from adults.

SEC. 2. That from and after the passage of this act it *shall not be lawful* to keep or maintain in any county infirmary in this State, *unless separated from the adult paupers therein*, any child or children entitled to admission into a children's home, except such as are imbecile, idiotic, or insane. And the *board of commissioners* of any county in the State, where such a home has not already been provided, *may make temporary provision for such children* by transferring them to the nearest children's home, where they can be received and kept at the expense of the county, or *by leasing suitable premises for that purpose*, which shall be furnished, provided and managed in all respects as now provided by law for the support and management of children's homes in the State of Ohio.

Commissioners to provide for such children's homes.

SEC. 3. That said Section 2 of the act of April 9th, 1883, be and the same is hereby repealed; and this act take effect and be in force from and after its passage.

A. D. MARSH,
Speaker of the House of Representatives.
JOHN G. WARWICK,
President of the Senate.

Passed March 27th, 1884.

Children, though in separate buildings, ought not to be kept on the infirmary farm. The "taint" is contagious, and more dreadful than the plague. Complete and unconditional separation is the *sine qua non*.

The need of the hour in this direction is, for every county not having already done so, to erect and maintain a suitably

furnished home large enough to temporarily care for all the homeless children that may be reasonably expected in its borders, until such time as they can be indentured or adopted in good private families. But thirty-three counties have such homes. Of these, only twenty-eight are strictly county institutions. The erection of proper buildings in the remaining counties is of interest not only to themselves, but to the State at large. As a means of preventing a tendency to crime and pauperism, they are worth to the taxpayer many times their cost. Here, as in bodily ailments, "An ounce of prevention is worth a pound of cure." In justice to counties that *have* built, those that *have not* should do so, and thereby shoulder their share of preventive work.

As sanitarians we can very properly and profitably discuss the location, size, and arrangement of these buildings; the grounds, water-supply, and drainage; training and culture of inmates, etc. Children's homes, unlike infirmaries, ought to be in or near a large town or principal city, preferably the county-seat. The advantages that accrue are many and various. Public schools and churches are more accessible. The gas and water-supply of the town can be utilized. The agency feature of the institution is more readily carried out, and a more critical public scrutiny maintained. Sufficient land for liberal grounds and gardens, and pasturage for cows enough to ensure a generous milk supply, ought to be secured; but general farming or other industrial pursuits on the "employment plan" should not be undertaken. The proper care of house, gardens, and grounds will more than furnish labor for any surplus ability. The immediate site for the building should be neither too high nor too low; extremes must be avoided. A naturally well-drained southern slope, with a gravelly subsoil, is the best. The proximity of a stream or spring as a feeder for a reservoir at a sufficient elevation to be used for flushing purposes would be an important consideration. The vicinity of factories, railroads, canals, and pleasure grounds ought to be avoided. The main building should face the north, and be not more than two stories above the basement. Nursery, kindergarten, day rooms, and dormitories for the children should be well supplied with light and air and located on the south side, the chapel, dining-rooms, apartments for superintendent, and help on north, the kitchen and

most of its accessories in the basement. Separate and suitable cottages should be provided for school, nursery, pest-house, and hospital. The laundry, boiler-house, milk cellar, and greenhouse should be in out-buildings.

Where the city water-works or a resorvoir is not available, a stand-pipe, in lieu of the usual attic tanks, is the only proper solution of the question of water-supply. Whatever the source, it must be pure in quality and abundant in quantity. Wash-rooms should be supplied with constantly running water; the liability to spread infectious eye and skin diseases is thereby reduced to a minimum. Water-closets, both outside and in, should be constructed of the best materials, and in accordance with the latest and most approved methods for the disposal of sewage and house drainage. Isolation and frequent flushing are of primary importance.

For correct ideas and painstaking details, the "Plan and Description of a Model Children's Home," by the Board of State Charities, is to be highly recommended.

Heating and ventilation, fire-escapes and extinguishers, ought to embody every good and well-tested modern plan and apparatus.

Any of quite a number of ventilating stoves and grates may be recommended. A well-constructed steam plant for large buildings is perhaps the best. The open fireplace ought to be used in all cottages.

The dietary should be plain but substantial; the clothing good and plenty. That for the larger girls variegated—as much so, at least, as that of private families. The time-honored distinction of "Sunday" and "every-day clothes" ought, by all means, to be strictly maintained. "Cleanliness is next to godliness." The soul-inspiring effect produced by donning a clean Sunday suit is a sure stepping-stone to a higher and better life. The sight of a hundred "Sunday shoes" neatly blacked and arranged in rows in the attic of a home in this State recently visited by the writer was a most charming one, and went a long way toward inspiring confidence in the efficiency of the management. Ample provision, by means of properly constructed and separately ventilated apartments and closets, should be made for the care of books, toys, and wearing apparel. "A place for everything, and everything in its place," is a good rule.

Habits of order and neatness should be at all times encouraged.

Having now an ideal location and buildings, what shall we say of surroundings, decoration, finish, and furniture? It must be more and better than is usually provided for the ordinary charitable and correctional institution—more than is possessed by the average citizen and taxpayer. It must come up to the average found in and around our best family homes. Why? Because it is in such we seek to procure the adoption of these unfortunates. The effort being voluntary on our part, and the recipients of the favor wholly passive, we are under a moral obligation to act right nobly. If a thing is worth doing at all, it is worth doing well. Let us, then, insist on having not only pure air, water, food, and sunlight, but also a wholesome display of the æsthetic, the novel, and the beautiful. Let us have shady groves, clean-shaven geranium-dotted lawns, evergreen trees, foreign and indigenous plants and shrubs of rare form and foliage, flower-bordered walks and drives, vine-entwined trellises, sparkling fountains, old oaken buckets, and moss-covered stumps and rockeries. Let us bedeck the inner walls with choice pictures and enliven the apartments not only with sunshine, but with singing birds and blooming flowers. Appeal to the moral nature by the old-fashioned Bible and the newest-fashioned songs; to the social, by holiday observances, Christmas trees, May-day parties, and strawberry festivals; to the intellectual, by a museum, a well-selected library, and stock of journals and literary magazines. In short, make of it a home second to none in the land. Not luxurious, but substantial, generous, liberal—one of which no citizen would be ashamed. In it a due observance of every rule and regulation must be enjoined. Every vantage ground must be used to refine and elevate those in charge, give them a higher plane, and prepare them for the best and most honored walks of life, keeping steadily in view the fact that the great primary aim and object of the management is to fit the inmates for and procure them homes in our best families; tempering zeal with prudence, and firmly maintaining a discipline so strict that children will seek and be satisfied with the private home and family rather than desire to remain in or return to the public institution.

The discussion on Dr. Darby's paper was opened by Dr. A. G. Byers, who said that there was no disposition of the public funds that yielded a better return than in the care and education of those children who would otherwise be uncared for.

The doctor said that there should be a distinction between a reformatory and a preventive institution. In times past, a child whose parents or relatives wanted to get rid of it was taken before a court and, under a criminal charge, consigned to a reformatory, when it had committed no crime.

These children were thrust into the reformatory, where they were compelled to mingle with children of depraved tastes. The establishment of children's homes is destined to remedy this evil.

The care of a child by the State is a matter of public economy. It costs far more to prosecute and punish a criminal than to care for the child. The doctor complimented Dr. Darby's paper, and said that he would have been glad if every county commissioner in the State could have heard it. He referred to the objection to the organization of children's homes by infirmary directors, who asserted that they would take away the most profitable source of their business. "There is no crime," declared the doctor, "committed in the State of Ohio so horrible as the placing of little defenceless children in county infirmaries. Think of surrounding a child with chattering, drivelling idiots; with human beings so deformed and hideous that even a physician would quail from them; with lazy, good-for-nothing garrulous old men and women!"

THE EFFECTS OF PRESENT EDUCATIONAL METHODS ON THE HEALTH OF WOMEN.

By CHARLES A. L. REED, M.D., Cincinnati.

IN a practice covering the last fourteen years devoted largely, and latterly exclusively, to the treatment of diseases of women, my attention has been attracted to the relative frequency of a class of cases of which the following are typical:

A young girl of fourteen of robust physique and excellent previous health begins to lose her appetite, is restless at night and fidgety by day; her expression changes, and instead of the radiant countenance her face bespeaks care and anxiety; she now has headaches, and there is tenderness along the spine; indefinite pains declare themselves in an erratic way in various parts of the body. In short, she has neurasthenia. She is ordered from school; is given a change of surroundings with rest, and returns quite restored.

A young miss of sixteen who has always enjoyed good health is now fairly in the high school course. She is bright and precocious. She runs and romps and plays and in various ways shows the physical as well as mental vigor with which she is endowed. But there comes a change. She begins to complain of pains low down in the back, and she begins to have serious trouble each month. After a short time that periodic function is but scantily performed or not at all. The roses now fade from the cheeks, the ruby from the lips, and the sparkle from her eyes. She develops a slight cough, has some fever in the evenings, and toward morning she may sweat a little. She looks pallid and worn in the mornings, but at this stage or a little later, as evening approaches, a flush is again on her cheeks, the red is again on her lips, and a bright light is again seen in her eyes.

But these delusive scintillations of apparent health deceive nobody, for they are but the evanescent play of colors on a ghastly background. There are patches of consolidation in both her lungs, and she is pronounced the victim of incipient consumption. She is now taken from the school-room when it is too late, and is started in quest of a health which has been forever lost. A young lady comes to me complaining of all that lot of symptoms which physicians know indicate disease within the pelvic cavity. Her general health is largely impaired. She is given a tonic, some advice as to the local management of her case, takes a month's rest from the school-room—for she is a teacher—and returns quite restored. Another lady, of the same calling, comes to tell about the same story, only she has another chapter to add. In addition to the backache, the front pain low down in the abdomen, constipation and painful urination, and painful menstruation, too.

She tells of great soreness in the pelvis when she walks. She feels the jar when she makes a misstep. She has to stop a few times as she makes the ascent to her room in the third or fourth story of the school-house; and the enforced standing while teaching is almost unbearable. She applies for treatment only when her physical discomfort makes such a course imperative. She is subjected to all the so-called "conservative" measures of treatment, both local and general, for from six months to two years. But all to no purpose, for there is now irreparable disease of the uterine appendages, and she finally purchases immunity from pain and restoration to health by going upon the surgeon's table, having the abdomen opened, and the diseased organs extirpated.

I could multiply the list of cases, but it would take too much space. I could cite instances in which both girls and women, pupils and teachers, had contracted diseases while in the discharge of school duties, and diseases, too, from which they had died. And just here I want to emphasize the fact that in the instances which I have cited I have painted you no mere fanciful pictures; they are cases from my note-book, where many more can be found. I bring them forward in this connection only that the discussion in which I purpose to indulge shall have a basis of fact. It is my regret, although not my fault, that the foundation is not even broader, for the revelations of one consultation-room are hardly sufficient data upon which to base general conclusions. A friend of mine, however, a politician, famed for the accuracy of his political prognostications, once explained that, local issues aside, he based his estimates upon a careful poll of but a limited territory, for it was his opinion that communities were not so essentially different but that one could be taken as the index of them all. Acting upon this principle, and taking the schools with which I am most familiar as one basis of calculation and the alleged vital statistics and the school statistics of the State as the other elements, I estimate that more than two thousand five hundred school children in Ohio die of causes emanating from the school-room.

It is the central fact in the foregoing cases, and in others of which they are types—viz., that they occurred in individuals subjected to conditions and influences which obtain in school

life to which attention is drawn. In endeavoring to analyze these conditions in their causative relations to diseases such as have been indicated, it may be well, for convenience of study, to take up (1) some general questions in school hygiene; (2) some especial hygienic conditions which affect female pupils; (3) some special hygienic conditions which affect female teachers; and (4) some suggested remedies. But, as we linger for a moment in a preliminary survey of the general question, we must be impressed with another idea, and that is that whatever department of the topic we may look at, we behold a battle of contending forces: those of vitality, as highly typified in the youth, on the one hand, and those of an opposite character, as exemplified in unsanitary conditions, which I shall discuss, on the other. I shall therefore arrange these forces in a sort of credit-and-debit style in fancied physiological ledger, and when I am through I shall ask you to assist me in striking a balance.

In discussing the influence of school-life upon the health of women, one is at once reminded that there are certain conditions obtaining in the school-room which influence both sexes alike.

The topic of general school hygiene is one so hackneyed that I fear its mere mention will already have wearied you, yet it is a theme of such urgent and present importance that it should be fairly thundered at all times until a too heedless public give ear to its teachings. Let me quiet your apprehensions with a promise of brevity. In opening this account we have to put on the invoice first a splendid bundle of potentiality in the form of youth. Youth, in this connection, implies expansive energy, a physiological impetus to growth and development, fortified with organisms to make that impetus sustained and effective.

In this country we can put down on the side of conditions promotive of vitality, good food, warm clothing, and comfortable abodes. We may take note, too, of an early childhood unrepressed with either undue restraint or responsibility. In short, the school age generally furnishes us with a child of fair physical endowment and surrounded by fair hygienic conditions at home. The child is, however, just entering an arena in which it is to encounter antagonistic influences. The

school-house itself furnishes the first adverse element in the conflict. Within its walls the child first sighs for the air which has placed the bloom upon her cheeks; she pants to resist the oppressive heat; the odors offend her yet untried olfactories; her hand is tremulous from nervous timidity.

In the next place, she is subjected—what there is of her—to the general unsanitary conditions which have been described. All that has been said relative to rest during menstruation applied to her case, too. The evil of stair-climbing is especially pernicious to her, because it is very probable that she presents a case of intropelvic disease provoked during her pupilage, and existing now at a later stage of development. Then there are some special considerations to be advanced in her case. I beg, first, to protest against the rule which requires teachers to stand during school hours, and which to my knowledge is enforced in some populous schools of the State. In one instance, I heard of a bumptious superintendent making the remark, after leaving the room of a teacher whom he had found sitting, that he "had just left Miss A. seated on her throne of idleness." You will not be surprised to learn that he came from the country where women are used as beasts of burden, and I know you will not be surprised to learn that America has gotten through with him, and that he is again in the Fatherland. It is in this way that an unwritten rule may be converted into an imperative law.

Black-board exercises and chart demonstrations when long sustained do damage by placing the abdominal muscles on a tension, and thus inducing persistent downward pressure of the pelvic organs. In some schools home visitations of pupils are enjoined upon teachers; this is an extra-professional and an unfair task not called for in the bond. This brings me, however, to speak of certain cases of illness among teachers in which the schools and school-work have been unjustly blamed. The long hours before and after school are very tempting to the ambitious teacher to take some extra task. Some take up an outside study, such as stenography, book-keeping, medicine, or law. Others actually become correspondents in law and other offices, attending to the task after having already done one day's work. It is by no means an uncommon thing to find some self-sacrificing creature doing

the domestic work for a whole family in addition to discharging onerous duties in the school-room. Of course the constitution breaks down under this double strain. I said that the school system could not be held responsible for these cares, but, on second thought, I beg leave to recall the remark. If, in the majority of instances, we examine the motive for taking extra work, particularly professional study, we shall find it is a desire to get into an employment that has about it some certainty of continuity and some hope of reward. The profession of the teacher has neither. The uncertain tenure of position, depending as it does upon that most fickle of all institutions, a political board, cannot but be a source of anxiety and discontent. As such, it directly depresses her powers, while indirectly it helps to break her down, by inducing her to take on tasks for which she is not fitted. Then, too, the nonsense of re-examinations is a source of some annoyance.

And now what can be said by way of remedy—for I take it that you have concluded, with your essayist, that an evil exists, and that a remedy is demanded? The public-school system is by all odds the largest and most potent single instrumentality in the United States. It illumines more minds, irradiates more homes with the sunshine of intelligence, it prolongs more lives and fills more untimely graves than any other one power in the land. It is the purpose of progress to retain that which is good and to eliminate that which is bad. I am aware that the philosopher would say, "Hands off; this is a fight for the survival of the fittest; let Nature's laws have their sway."

This is wrong; the feeble minority have their rights, and it is the business of the humanitarian to respect them; it is the business of the humanitarian to see that the conflict is a fair one; and it is particularly his business to see that the feebler combatant in the arena be not placed at a disadvantage by man-made conditions; and this brings me directly to the point. I would strip our school system of everything that is artificial and adventitious, and bring it back to natural ways and natural methods. I would see to it that a curriculum of study was arranged with reference to the physiological synthesis of the mind. It should be remembered that a precept is the necessary antecedent of a rational concept. The senses should, therefore, be cultivated in an easy and gradual way,

and should be made to contribute to the growth and development of the superior or intellectual centres before those centres are called upon for original work. But I am not dealing now so much with the psychical as with the physical phase of these hygienic topics. Turning, therefore, to this other phase of the question, I would have a school-house something better than a "Black Hole of Calcutta." The air is free—except to school children—and I would give it even to them. The greatest of all mental and cerebral stimulants is oxygen, and I would furnish it to them in wholesome and generous quantities. The brain work of the world is done north of the frost line. I would therefore take the hint which Nature and history furnishes, and keep the temperature of the room within normal limits—70° Fahr., or less.

It is preferable to generate the heat within the pupil than outside of her, and it is vastly more economical to use her lungs as a furnace, with pure air as a fuel, than the stove as a radiator and even natural gas as a combustible. In the particulars of house construction, I beg to observe that it is a penny wise and pound foolish policy which prompts the saving of ground in our cities to such an extent that to secure rooms our temples of learning are converted into veritable towers of Babel. But if from necessity they are built high, girls of from twelve to seventeen should never be called upon to climb the long flights of stairs.

And while I am not now pleading the cause of the youngster, I must say that neither is it fair to send a little tot on such a journey. Numerous cases of irreparable heart strain have had their origin in this way. The high school-house is in every way an evil, and should be abolished.

I have never yet recovered from my dread of stated examinations, and I shall never cease to inveigh against the custom. Aside from making me unhappy, it did me a positive hurt, and it is doing the same for children everywhere to-day. I have no respect for that bumptious specimen of egotism called a superintendent, who fancies he can gauge the mental growth and development of a class by putting a few questions to a lot of timid children whom he has already scared out of their wits by the advance announcement of his majestic approach. That teacher is unworthy her calling who cannot,

at the end of the year, indicate with accuracy and precision just which pupils are and which are not ready for promotion, and her dictum should be final. The farce of final examinations should be done away with. Published grades do more damage than good in the cases of sensitive girls of moderate capacity.

But the running criticisms which I have made are sufficiently suggestive of the various remedies which I would propose for special evils. But here I beg leave to make one more general criticism, if for no other purpose than to pave the way for one general remedy which I consider of great importance. The criticism is that our present school system, relying almost exclusively on books as the media for the communication of knowledge, tends to develop the reflective centres rather than the perceptive faculties; and, through the imposition of inordinate tasks, brings on an ultra-mental mood which is inimical to the physical welfare of the pupil. In the cases of sensitive girls this wear and tear brings on a state which a scholarly friend of mine has aptly designated as one of "morbid subjectivity." The remedy which I would suggest for this state of affairs is more attention to physical culture, not in our select schools and endowed colleges, but in the public schools, the university of the people.

Do not think from what I have written that I take a gloomy view either of the present or the future. On the contrary, I am a pronounced optimist on this as on every other topic, and accordingly believe that the schools of to-day are better than those of any previous day; that the health of school children is better, and that the teachers have a finer physical stamina. Five years ago I presented to this society a paper, under the title of "The New Fashion," in which I outlined what I then discerned to be a growing tendency in education and educational methods, and I am glad to say that the time which has since elapsed has confirmed the impressions of that time. What was then a subordinate tendency has, in many quarters, become a leading characteristic. My present complaint—that contained in this essay—is but a protest against the longer continuance of certain remaining evils viewed from my particular standpoint as a specialist in medical practice. These evils are less striking than they were, and, I am happy

to believe, are gradually receding before the new order of things. This new order involves the adoption in our schools of the axiom taught by Beecher, that the successful man must first be a good animal; it involves recognition of the principle that education, to fulfil its true end, must effect the co-ordinate development of the physical and the mental organisms, if, indeed, they be capable of separate mention. Germany ignored this principle until she was whipped by the French; she returned to the north of the Rhine, built what we call a gymnasium by the side of each school-house, renewed the conflict, and triumphed over the great Napoleon. It was Wellington who, speaking of the triumph of the English arms in that conflict, said that it was the manly sports of Eton that won the battle of Waterloo. Shall we not also say that it was the soldierly bouts of West Point that triumphed at Vicksburg and Appomattox? But if physical culture has had such an influence on history through the medium of men, what possibilities are not in store when the effort is made effective to influence our race through the more conservative organism of women! The tendency is already more than marked. Wellesley, Vassar, Brown, "The Annex," and Smith's colleges have excellent gymnasia, and, as a consequence, are doing much toward eradicating that angular and barren type of womanhood which was the joint product of New England schools and Puritan asceticism. I would that our Western colleges were following the examples of their Eastern competitors, but, so far as I can learn, they are making no satisfactory effort in that direction.

But my special plea on this occasion is not that our select colleges, but that our common schools, through legislative enactment, come to the rescue of pupils who are now dying, the victims of defective educational methods. This can be done only by imitating the example of Germany, and establishing facilities for physical culture at each school-house. This will, at least, turn the attention of a rising generation toward an ideal manhood and womanhood, and start them on the way of attaining its realization.

HOUSE DRAINAGE AND SEWER CONNECTIONS.

By WILLIAM OWENS, M.D., Cincinnati.

IN considering a system of house drainage and sewer connection, no compromise can be made between conflicting plans, each more or less meritorious; nothing less than the best should be selected—that system only which will secure in the most complete manner the most speedy and thorough removal of all liquid waste and fæcal matter from the premises, and at the same time exclude as far as possible all sewer gas from the same.

As far as we have been able to learn, no one method has proven entirely satisfactory. Their defects have been variously charged to faulty plans or defective construction. It would be unnecessary to undertake to discuss these various systems or, indeed, any one of them, for I doubt not that they are familiar to all present, and their defects noted on more than one occasion. However, this one observation may be allowed, that some of these plans are complicated and expensive, and while they may be in a great measure effectual, they are not available for the above reasons. We will concede, for the purposes of this paper and illustrating the views to which we desire to call your attention, that the general plan upon which a sewer is laid may be correct and the construction without fault, as now understood, and up to the highest standard of excellence, and that the main lines are properly ventilated by manholes, catch-basins, gullies, etc., and that the house connections are as perfect as it is possible for the plumber's art to make them; yet we do find very frequently sewer gas in sinks, wash-stands, and bath-rooms, especially if they are allowed to stand a few days without service. The reason for this is understood and believed to be found in the pressure of the sewer gas upon the seal of the running trap of the soil or waste-pipe, which is known to be considerable, and that under this pressure a large quantity of the more

volatile portions of this gas is absorbed, and again emitted into the upper portion of the soil or waste-pipe, where the pressure does not exist. If the pressure is very great, the seal may be forced or broken by siphonage when the sewer is flooded.

It may further be borne in mind that sewer gas is not always of uniform specific gravity. Some of its elements are much more volatile than others and tend to escape upward, while the others, being more dense, tend to precipitation. By a knowledge of these facts and their relation to physical law, we are able to intercept this gas before it reaches our homes. If it were possible this should be done in the sewer mains by manholes, gullies, etc. But this has never yet been successfully accomplished; a part only is thereby intercepted; a considerable portion passes on and enters the soil and waste-pipe, and thence our residences.

The running traps on the soil and waste-pipes have been found insufficient to protect us, as many of us have witnessed. To avoid repetition, I will relate some observation in three or four instances. In one of our largest hotels it was found that offensive gases believed to be from the house connection with the sewer were found in several of the rooms. The matter was kept as quiet as possible. A plumber was called in—the result is not known. Another case, that of a private boarding-school. The soil-pipe was trapped with the usual running trap; the stationary wash-stand, bath-room, and kitchen sink were all trapped in the usual way. The sewer with which the connection was made emptied into another and larger one, and this into a mill-creek more than a mile from the school-house. When the wind was bearing strongly from the west or south-west, the kitchen, bath-room, and several of the chambers were affected by the sewer gas which had been forced up from the mains. A good and intelligent plumber was consulted, who gave it as his opinion that the difficulty could not be remedied without a complete overhauling of the plumbing, and in placing new and improved traps, etc. The trouble *was*, however, remedied by the following very simple device: a two-inch lead-pipe was inserted into the soil-pipe midway between the sewer and the running trap, and conducted to the top of the barn on the rear of the lot, and about one hundred

feet from the school building. The remedy was complete. Another example—sewer gas entering houses—occurred in one of our suburbs. Four houses were built in a block; each had its own soil-pipe, which also discharged the roof and waste waters of the house. There were no traps placed upon the soil-pipes. The houses were distant about one mile and a half from the final discharge of the sewer into the Ohio River. The gas from the sewer entered all of these houses, forced nearly every trap, and caused a great amount of illness among the occupants of the houses. Several persons were quite sick in consequence, and one child died of enteric-fever. The soil-pipes were trapped, and a ventilating-pipe two inches in diameter was inserted into the several soil-pipes between the sewer and the traps, and conducted to the curb. Thereafter no sewer gas or other offensive odors were observed in the houses.

In 1877 I had occasion to build a house, and was much exercised over the question of non-admission of sewer gas. I had examined much of the literature upon the subject, and was beside a constant reader of, at least, two journals devoted to sanitary science. I also consulted one of our best plumbers in regard to the matter, and yet was not satisfied. I caused an extra flue to be built in my kitchen chimney, and had it lined with vitrified salt, glazed sewer-pipe two inches in diameter—this to be used as a ventilator for my soil-pipe external to the trap. I was laughed at for my pains. I consulted Colonel Waring, editor of the *Sanitary Engineer*, who replied through that journal condemning the plan, and said that he did not think that the citizens ought to allow their houses to be used for ventilating public sewers. During three years this connection with the soil was not made. I had on many occasions during that time observed that my traps were siphoned by floods in the main sewer. Test showed that at almost any time gas could be detected escaping from the stationary wash-stand and bath-tub. I finally determined to carry out my original plan, and ventilated the soil-pipe; a two-inch lead-pipe was used and carried from a point four feet external to the trap on the soil-pipe to the flue in the chimney.

I can assure you that my plumber as well as myself was in no small measure surprised to find so powerful a pressure of gas from the sewer. A candle was blown out at a distance of

twenty-eight inches from its opening, notwithstanding that there were three catch-basins and two manhole ventilators within one hundred feet of my residence.

After the connection was made between the soil-pipe and the flue there was no further trouble. The principle invoked in the three cases mentioned consists in the insertion of a ventilating-pipe into the soil or waste-pipe between the sewer and the running trap of the soil-pipe, thereby conducting a very large portion of the lighter sewer gas through another channel into the open air. The heavier portion of the sewer gas may be absorbed by the water of the seal, and as this portion is non-volatile, or largely so, it will remain there imprisoned, and is harmless.

DISCUSSION OF DR. WILLIAM OWENS'S PAPER.

By A. A. ELLIOTT, M.D., Health Officer of Steubenville.

IT may seem strange to you—it does to me—that I am called upon to open the discussion on this subject, coming, as I do, from a city without sewers, and consequently with no sewer connections; yet, notwithstanding this great deficiency in what has been supposed to be supremely necessary for the comfort and health of the inhabitants of every city and town, our death-rate is less than that of any other municipality in the State or United States as far as heard from, and, perhaps, indeed, in the world.

One must be occasionally allowed to engage in self-praise, particularly when the subject is a collective one, as in this case; and I will only add that situated as we are, in Steubenville, on a gentle slope on the bank of the beautiful Ohio, there can be no wonder that we are blessed with health beyond that of our sister cities, and have, as a consequence, no pressing need of sewers or sewer connections to add to our happiness.

On the subject of house drainage, let us dispossess ourselves of the idea that we are experts, and take an every-day, common-sense view of it, leaving "joint connections" and

angles in waste-pipes to the sanitary engineer and to that oft-martyred individual, the plumber, for the present, at least—*i.e.*, in a plain week-day style, with no assumption that we cannot find a "Sunday suit" to put on if the occasion require.

The first thing, to begin at the foundation, that appeals to me in draining my house is the character of the soil upon which it is to be built. We can safely say that there can be no perfection in drainage when the ground is composed of "made earth," or yellow clay, or any other, unless it be of a gravelly or porous nature. Dryness of the soil is more important than drainage of the waste products of the structure that is reared upon it. One is a constant and the other a variable quantity; one is promotive of health and the other dangerous to life.

I have in mind a beautiful home, situated on the side of a gently sloping hill. The drainage of the waste material of that house is seemingly perfect, but the ground upon which it is built is soft, yellow clay. The surface water from the hill-side above it sinks into the earth or washes over its surface, seeking an outlet at any available point. As a result, the cellar of that house is damp and muddy, and "all the perfumes of Arabia would not sweeten" it. The house is unhealthful, and what might be a perfect abode is only a death trap on account of the nature of the soil upon which it has been built. In Bible days the folly of a man's building his house upon the sand was held forward as an example of short-sightedness; but then the rains and storms beat upon that house and destroyed it; but in our case, while the house stands, the owner and his family fall, leaving the dwelling as a monument of their destruction.

Then, in building a house, seek if possible a soil of a gravelly or porous nature, and if this be impossible, make it so by excavating the cellar deep enough to place beneath the cement several feet of broken stones or gravel, and by surface and subsoil drainage of the surrounding land you may hope to have a comparatively dry and comfortable dwelling, but not such as that where the natural condition of the earth furnishes these requisites.

That part of the subject relating to sewer connections is, indeed, one of *vital* importance, and how we shall dispose of

the waste products of our houses in cities is a question of the *gravest* importance.

What is a sewer? A sewer is an artificial underground channel, with ramifications extending to all portions of a city, filled with the foulest of contents, solid, liquid, and gaseous; and, gorged with this filth, it vomits it, usually into some running stream, where it floats downward, to be pumped into the reservoirs and poured down the throats of those who dwell below us and are dependent upon this same stream that we have thus poisoned for the water they drink. That is a modern sewer, the theory of its construction being based upon selfishness and criminal carelessness concerning the health and lives of others.

Do we want our houses connected either directly or indirectly with this monster, whose capacious maw is filled with stench more noisome than a vulture's vomit? I would say, no; and while I cannot in this discussion lay down a substitute for the sewer and its connections, I can say that the wise thing to do in dwellings where there are sewer connections would be to seal both ends of the pipes and remove them entire.

Every man who connects his house with a sewer not only endangers his own life, but contributes to the destruction of his fellow, by thrusting into his stomach the excrement and offal of his house and household in order that he may be saved a little trouble. Were it possible to have legislators take the same interest in public health as they do in public wealth, no more streams would be polluted by such horrible means. But alas! in a country where every available aid is brought to bear to stamp out pleuro-pneumonia in cattle, because it depletes the pocketbooks of their—the legislators—constituents, and they refuse to enact a law that will protect their fellow-man from fraud and dishonesty, leaving our State free to all charlatans to roam over at will, what can we expect?

What shall we do with the waste products of our towns and cities? I answer, Anything rather than pour it down the throats of those who cannot resist; anything rather than poison the water, so that its finny denizens gasp and die because of its pollution. Anything is better than criminal carelessness and neglect, and compelling others to drink the filth that flows from our towns and cities.

VENTILATION OF SEWERS.

By JOHN MCCURDY, M.D., Member of the American Public Health Association, Ohio State Sanitary Association, City Board of Health, etc., Youngstown.

THOSE eminent in qualifications for judging say that there is no agent so productive of disease in its protean forms as bad air.

This subject of ventilation has not yet reached the certain and satisfactory basis it deserves.

The painstaking and laborious experiments made by modern sanitarians reveal many startling facts. One of the most practical is, that ground air is ever present, and charged with deadly organic impurities.

In the vicinity of all forms of decomposition it matters not what may be the plan or material of our homes; luxurious or simple, however perfect their plumbing or drainage, if the earth surrounding them is fouled by house waste of any description they are but huge vent pipes for the ground air, carrying its load of virulence, to pass first into the cellars, then rapidly from floor to floor to the attics. This is strikingly true of modern houses, where the heating apparatus is placed in the cellar, a partial vacuum being so caused in said apartment; and the outside pressure being constant, keeps up an ever-ascending current.

During long and hard freezing periods the emanations through the soil are almost wholly arrested, and in winters with moderate freezing but great rainfall the air spaces in the soil are occupied by the water, and the air thus displaced is also pressed or drawn into the basements.

This condition fully explains the great prevalence of so many types of fevers in winter, such as typhus, typhoid, scarlatina, diphtheria, etc.

Life-long bereavements from the above have taught many intelligent people to keep absolutely nothing in their cellars that can decay or generate gases.

It will be unnecessary to go further and emphasize the necessity of sewer ventilation if this vital prerequisite is not secured—viz., absolute purity of soil surrounding the dwellings.

The construction and ventilation of sewers are hoary with age.

That vast city of the Seven Hills and mightiest of military camps, from which marched out legions with eagles upon their banners to conquer the world, was so interlaced with sewers of all sizes that Pliny called it a city suspended in air rather than set upon the ground; and so well ventilated were they that Agrippa, when in charge of the public property, passed through them in a boat, receiving great praise as an efficient officer.

Two thousand six hundred years ago the Romans had effected the dexterous use of the two mighty weapons that could destroy what the military genius of the world for centuries tried to do and could not—viz., perfectly constructed sewers and copious flushing of the same by sweeping torrents of water turned into them from their mammoth aqueducts.

In Egypt, Babylon, and Assyria many of their sewers were open canals, and in Paris at an early period the same is true.

The first sewer ever covered in the latter city was in the time of Charles the Sixth, by Hugh Aubroit.

London has had sewer commissioners since early in the thirteenth century; but the structures then made were for the conveyance of storm water only, and the people strictly prohibited from allowing any sewage to pass through them, cesspools being used for house waste.

In the construction of sewers Rome used stone, which undoubtedly far excels all other materials when used as by that city. So accurately were the arches formed and so carefully the stones fitted that, after standing twenty-six hundred years, parts of them are yet well preserved. Many of the Paris sewers are of stone, and those of London are of brick.

The latter city has some sewers fourteen feet in height and six and one half feet in width, and her system is more than two thousand miles in length, at a cost of more than $150,000,000, and ventilated by iron gratings, which answer fairly well.

London has tried many ways of ventilating her sewers—

sometimes by tall pipes; but the odor was so intolerable this plan had to be abandoned.

Again, by passing the sewer air into the tall stacks of manufactories; but explosions would at times take place of a disastrous nature.

The task of so ventilating large sewers that their horrible stench can be removed is so difficult that the very best engineering and scientific attainments have been secured.

By far the best results are secured by thoroughly and constantly diluting the sewer air with atmospheric, and the more rapid this mixture the more satisfactory the plan. London, with her open gratings, illustrates this mode on the largest scale, and proves that it is the least offensive of any now in use.

Difficulties will constantly beset any plan in attempting to ventilate without first securing thoroughly competent engineers, who will have the sizes and gradients bear the proper relations to the amounts of sewage and storm water to be removed.

In my opinion, through the care and efficiency of our city engineer, the growing little city in which I live has a system of sewers and ventilation far in advance of most places. Being of rapid growth, the old part only is sewered, and this by circular brick, egg-shaped brick, and tile conduits. When the area to be drained is not too extensive, tile makes the most satisfactory and cheapest sewer.

Egg-shaped sewers, as constructed with us, are very desirable and durable. They are built from four (4) centres, and from said centres four (4) sets of radii pass; thus all parts of the wall are on a curve, with no flat internal surface, which secures great strength and prevents their collapse from outside pressure.

Many of these sewers being long, the gradients of their sections differ, ranging from ten feet to four tenths of a foot per one hundred feet; the most satisfactory grades being from three and two tenth feet to one foot in the one hundred feet.

Although a few sewers have lighter grades than the above, they are all self-cleaning. These sewers, with their laterals, all discharge into one main sewer, circular brick, seven feet in

diameter at its mouth and gradually running to five feet at its present terminus, and is eight thousand feet long.

The gradient of these laterals, when eighty-four inches in diameter, is one and eleven sixteenths inches in a hundred feet ; at seventy-two inches the same, and at sixty inches, two and eleven thirty-seconds inches in a hundred.

With these gradients, when running half full, the velocity is five feet to the second, and when running but twelve inches in depth the velocity is one and one half feet per second. This sewer was planned to drain two thousand five hundred acres, but at date is not extended to that degree.

Mr. Reno, city engineer, and myself entered this main sewer at its mouth, and passed through the entire length for the purpose of inspecting it and its laterals, and found it doing its work well, its grades and floor being ample for self-cleaning, and the sewer air so well diluted that neither felt greatly oppressed ; nor was the odor at any point excessively offensive. The mouths of its laterals were clean, and flows from same unobstructed.

The system just sketched embraces rather more than ten miles of sewerage.

Sewage thrown in at the terminus of any of its laterals reaches it in about one and a half hours. Catch-basins are placed in the sides of the streets from two to four hundred feet apart, which receive all surface flow. These have settling chambers, their size being about twenty inches in depth and two and one half feet in diameter. By this plan all heavy substances are retained and removed by the street cleaners, as occasion requires.

Ventilation is secured by six-inch pipes from the sewer to within four inches of surface, and covered with a heavy iron cover twenty-two (22) inches in diameter, and perforated with one-inch openings thirty-six in number. At the street extremity of this pipe is a circular chamber one and a half feet deep and two feet in diameter, into which all street wash is received, and cleaned as the catch-basins are.

These ventilators are not at regular intervals, being from one to four hundred feet apart.

This plan of ventilation is substantially that of London, and the best yet extensively tried.

I will say here that the practical working of these perforated ventilators is good. The heat of the sewer air melts the snow and frost readily, and the mud deposited by storm wash and vehicles is kept so moist that it passes into the catch-basins below the covers, and very seldom requires the aid of the street-cleaning force.

As ventilation is essentially dilution, and as it can be demonstrated that currents of atmospheric air can enter the sewers thus constructed by at least three ways—viz., first by passing into the catch-basins, then into the sewer direct; or, second, by passing through the perforated tops, where there is little or no upward pressure; or, third, by passing into sewer by the perforations nearest the circumference, while the sewer air passes out, each occupying but a part of the ascending pipe. Again, the partial or complete filling of the sewers by storm water creates strong currents, so it is easy to see that sewers constructed as described change their air often.

Sewage that is kept constantly on the move and its downward velocity steadily increased by additional currents along its course has no time to become putrescent, and the little decomposition that does occur and is the most dangerous, as carbonic acid and sulphretted hydrogen, are either absorbed by the current or carried along by the same.

Another fortunate coincidence is the fact that the amount of water necessary per capita for the occupants of a residence will be ample to dilute and float the refuse of same.

The escaping of sewer air along the middle of a street from the ventilators placed at the distance already stated is so quickly diluted that, in my opinion, no harm can ensue.

The odor of sewer air is not to be dreaded. It is that intangible substance called "organic vapor," which has no bad odor, that is the carrier of death-producting germs, and which is never present in a sewer when the atmosphere has free ingress.

As sulphretted hydrogen is not only the most offensive but the most deadly of sewer gases, I recently made some experiments to approximately determine from what part of the sewerage system it was most abundantly generated.

Taking pure white writing-paper, I saturated the sheets with a solution of acetate of lead, and placed some over catch-

basins, and others over street ventilators, and others over the ventilator of a private residence.

Uniformly, I found that the paper over the catch-basins were the darkest from sulphuret of lead ; next the street ventilators ; and so slight was the coloring from the drain of the private house that it could not be observed more than about every third morning.

I shall say here that many private residences had four-inch connections, but on account of careless persons throwing into same pieces of cotton cloth, large quantities of paper, etc., they were clogged, and several had to be removed and relaid by six inch, since which no trouble has been experienced.

If my experiments were correctly made, the catch-basins are the principal harbingers of filth, and require the constant care of the sanitarian. My experience leads me to the conviction that they should be invariably and thoroughly cleaned, and contents removed immediately after each rain during the year save the three winter months, and throughout the summer quicklime should be freely thrown into them.

Allow me to call your favorable attention to a new system of sewer ventilation, known as " the McAndrews' System, of Youngstown, O.," which was brought to my notice some two years ago, and which can be adapted to a single house connection, or so enlarged as to ventilate sewers of the greatest dimensions.

The working of this system I have carefully watched on many occasions. It is now in successful operation in one of the new, most expensive and carefully constructed blocks in our city.

It is built on the belief that the great bulk of sewer air is lighter than atmospheric, and that gases always expand to the full capacity of their container. The cut of this plan I now exhibit. It shows the fresh-air pipe and foul-air pipe, but not the pipe inside the house to which the attachments are made. Its material is always that of the sewer to which it is attached, and the same in size. There is an oblong enlargement called an expansion chamber marked " A," its capacity being two or more times that of the sewer to which it is attached. Near this chamber and rising from the sewer is a vertical pipe marked " B," open at the top, and into which the atmosphere presses.

From the terminus of this sewer ascends a pipe, and it passes up to the highest occupied portion of the house and closed at the upper extremity, and to this pipe all closets, sinks, etc., are connected.

The outside air, passing through pipe "A," goes to the bottom of the sewer, being heavier than the sewer air, and mingles but little with the latter, and by so doing creates a current in an opposite direction, which passes along the upper portion of the sewer, and coming to the expansion chamber marked "A" it becomes still more attenuated and thus rarefied, passes rapidly up the escape-pipe "C" to a point deemed safe above the top of the building.

As will be seen, if this principle is correct, all that is necessary is to make the expansion chamber a certain number of times larger than the sewer, and the escape pure-air pipe bear proper proportion to the same, that free ingress and egress can take place; then constant currents and consequently thorough ventilation are secured.

I have watched the openings into the pipe which receives the ventilating connections of the various floors both in calm weather and when the winds were variable and contrary, and by placing a piece of light paper accurately over any of said connections, the downward suction was so uniform and constant that it would be held by the same in place for an indefinite time.

Many competent persons interested in sanitation, both practical and scientific, have examined this plan, and I have never heard an adverse criticism.

In my opinion it is by far the most practical and scientific invention yet tested.

If, indeed, it bears the tests yet in store for it as it has those already made, it will be a safeguard so complete that no householder will longer be in constant dread of forced traps by germ-laden air; nor will the horrible stenches of immense sewers be ever present and inhaled by each breath as to-day in many cities and towns. When adopted all street gratings will be closed, all ventilating pipes near the ground or dwellings be permanently sealed, and the lower strata of air, in which "we live, and move, and have our being," will then be wholly free from the offensive and deadly combinations that now exist.

THE HEATING AND VENTILATION OF PASSENGER COACHES.

By R. HARVEY REED, M.D., Surgeon-in-Chief of Transportation Department, B. and O. R. R., west of Ohio River, Mansfield.

IN looking over the files of the *Railway Age* for the year just past I have failed to find a single article, either editorial or otherwise, on the subject of Heating and Ventilating Passenger Coaches.

Out of the many valuable "editorials" of that able journal during the past year, only eight are on the general subject of "Heating and Lighting of Passenger Cars," and one on "Heating without Burning," and in neither of these is ventilation taken into consideration.

In the "communications" to that same journal for the same period, I found only one article on "Heating and Lighting Cars by Electricity," while in the "miscellaneous" department I found eighteen different articles, under various titles, on the general subject of heating and lighting passenger cars, but not one article on the ventilation of these nomadic palaces, in which hundreds of thousands of people live daily.

You will observe that during a year in which, from a combination of causes, the subject of heating passenger coaches has been agitated more than ever before by the public, during which time one of the leading national journals devoted to the interest of the railway world has published an average of over an article every fortnight on this important subject; yet with all this, I have failed to find a single article on the ventilation of passenger coaches, which, from a sanitary point of view, is inseparable from perfect heating.

In the ideal heating and ventilation of passenger coaches there are, at least, five primitive factors to be taken into consideration—viz., efficiency, safety, simplicity, durability, and economy. By our present methods of heating and ventilating passenger coaches, the first two of these prime factors are certainly wanting; and without them (from a sanitary standpoint) you might as well try to sustain life in a man without

either heart or lungs, as to endeavor to establish a system of heating and ventilating passenger coaches without efficiency and safety being first fairly stamped upon it.

The travelling public not only require these, but they have an inalienable right to demand them, and if their demands are not heeded by our railroads, and the voice of science is not allowed to be heard in these matters, it is to be feared that they will, in their haste, make commands through our legislators that will, for the time being at least, only make a bad matter worse.

That our present systems of heating and ventilating passenger coaches is faulty and inefficient is certainly beyond dispute; yet if there is a man here to-day who doubts it, I think I need only refer him to the personal investigations made by Professor C. C. Howard, of Columbus, and the author, less than a year ago, on this very subject, which, I think, are sufficient to convince any unprejudiced mind of the truth of this assertion.

In these investigations, which were conducted on four leading railroads, under a variety of circumstances, on first-class trains, while in active service, the results of which I reported in a paper presented to the section of "Public and International Hygiene, of the Ninth International Medical Congress," it was found that* "the greatest, least, and average difference of temperature observed between the inside and outside of passenger coaches while running, during the winter season, was 80° the maximum, 37° the minimum, and 54° the average in thirty cars, including smokers, ladies' coaches, and sleepers in first-class trains.

In the same series of examinations, it was found that the greatest, least, and average difference observed between the extremes of temperature in coaches while *running*, during the winter season, was 27° the maximum, 0° the minimum, and 7⅞° the average.

In following up the same line of investigations we found that the greatest, least, and average difference observed between extremes of temperature in coaches while *standing*, dur-

* See a report on the Sanitary Inspection of Passenger Coaches, by the author, in the proceedings of the Ninth International Medical Congress; also published in the *Sanitary News*, Vol. XI., Nos. 205 and 206.

ing the winter season, was 27° the maximum, 1° the minimum, and 7° the average.

Again, the greatest, least, and average difference observed between the extremes of temperature in coaches *running* and *standing*, during the winter season, was 29° the maximum, 5° the minimum, and 13¾° the average.

When we compared the temperature at the bottom of the cars with that at the level of the head, we found the greatest, least, and average difference to be 30° the maximum, 12° the minimum, and 18° the average.

You will observe that we have made comparisons of temperature under five different circumstances and conditions, and with a remarkable sameness in the general results, all of which show a deplorable variation of temperature incompatible with health or a proper sanitary condition. (For particulars of these investigations see chart No. 1, in the report above referred to.)

In these same investigations there was not the corresponding ratio between these extremes of temperature in the coaches and the outside atmosphere we expected to find.

For example, the greatest difference of temperature between the outside and inside of a car occurred in a smoking-car on December 16th, 1886, with the mercury at 4° above zero, while the least difference occurred on both a smoker and sleeper on March 28th, 1887, with the mercury outside at 27° and 30° respectively.

Again, the greatest difference between the extremes of temperature in a car while running occurred in a sleeper March 28th, 1887, with the mercury outside at 27° above zero, and the least difference between the extremes of temperature of a car while running was on a smoker on December 29th, 1886, with the mercury outside at 22° above zero.

The greatest difference of temperature while standing occurred in a sleeper, March 28th, 1887, with the mercury outside at 27° above zero, while the least difference of temperature while standing occurred on a sleeper December 29th, 1886, with the mercury outside at 16° above zero.

The greatest difference between extremes of temperature on a coach running and standing was in a sleeper March 28th, 1887, with the mercury at 27° above zero, while the least dif-

ference occurred on a sleeper December 16th, 1886, with the mercury outside at 4° above zero—the coldest day we were out making these inspections.

Again, we found the greatest difference between the temperature at the bottom of car and the level of the head occurred in a sleeper March 29th, 1887, with the mercury at 12° above zero; while the least difference was in a ladies' coach, two of which registered the same; the one on December 29th, 1886, with the mercury at 18° above zero, and the other March 29th, 1887, with the mercury outside at 12° above zero.

We found that 6⅔ per cent of these coaches were heated by stoves, 36⅔ per cent by hot air, and 56⅔ per cent by hot water in the form of the Baker heater.

With the use of the common stove we found that, with a temperature outside of 10° above zero, the difference between the extremes of temperature in a car when running was from 5° to 6°, and the same when standing, while the greatest difference of temperature on the same car between running and standing was 8°, and that between the bottom of the car and the level of the head was 17°.

In cars heated by hot air, the difference between extremes of temperature while running was from 2° to 14°, with the mercury outside at 30° and 15°, respectively.

The extremes of temperature while running and standing was from 8°, with the thermometer outside at 30° above zero in one instance and 15° above zero in another, to 18°, with the thermometer outside at 4° at one time, and 15° above zero at another.

In cars heated by hot water there was found to be a difference of temperature while running varying from 0° to 27°, with the mercury outside at 22° and 27°, respectively, above zero, and a difference of temperature between running and standing varying from 2° to 29°, with the mercury outside at 4° and 27°, respectively, above zero; while the difference between extremes standing varied from 1° to 27°, with the mercury outside at 16° and 27°, respectively, above zero.

By these same methods of heating, a variation of temperature between the bottom of the car and the level of the head while sitting was found to exist, varying from 12°, with the mercury outside at 18° above zero in one instance, and 12°

above in another, to 30°, with the mercury outside at 12° above zero.

In those cars in which hot-air heaters were used, and which, as a rule, are usually at each end of the car, with a hot-air conduit running along each side and bottom of the car, there was found to be great uncertainty in the supply of warm, fresh air.

Being entirely dependent upon the motion of the train or the outside currents of air, all of which were undergoing rapid changes which were modifying each other with the onward course of the train, we found, as a rule, good draughts from the registers of those conduits which came from the heater at the front end of the car, while those coming from the heater at the rear end of the coach, there was a very great irregularity, with often little or no draught.

In those registers in the conduit coming from the heater at the front end of the car, the draught was often so strong and the air so hot as to necessitate the closing of the register by the party sitting next to it, while his neighbor on the opposite side of the car was as much too cold as the former was too hot.

The cars heated by hot water usually consisted in a heating apparatus placed at one or the other end of the car, with an arrangement for heating salt water very hot, usually by means of a coil of pipe, which was continued from the heater around the entire car, running back and forth under each seat as it encircled the car, and finally connecting with the other end of the coil at the heater. By this ingenious arrangement, a constant current of hot salt water is intended to be kept circling through these pipes around the entire car, which, as fast as it became cool, would return to the heater to be reheated. These are not only dangerous—often exploding with terrific force when out of order—but they were found to be inadequate to properly heat the coaches in cold weather, and certainly failed to keep up an even temperature throughout the car even when pushed to their utmost, which in turn would necessitate the closing of the ventilators, thus preventing the use of the limited and unsatisfactory means of ventilation provided in these cars, by the top system of ventilation, and hence were utterly useless so far as the ventilation of the car was concerned.

When we remember that these investigations were made on first-class trains, equipped with first-class cars, we are led to the natural and legitimate conclusion that the fault must lie with our present system of heating and ventilation of these coaches.

Some of the present defects now found in the ladies' coaches and the smokers might be, to a certain extent, remedied by building vestibules at the ends of each car, and thus economize the heat; yet when you remember that we found as much as 29° difference between the extremes of temperature even in a sleeper, with all the improvements of construction that science has suggested, you will certainly be convinced at once that there is something else at fault other than the mere construction of the car itself.

We found the greatest and really most important difference in temperature between that at the level of the head and that at the surface of the floor, which, in one instance, amounted to 30°, and that, too, in a sleeper, which is supposed to be the best and most comfortably equipped car we have, and for the privilege of riding in it the public has to pay an extra fee; yet in this travelling palace the minimum difference between these two extremes of temperature was 12°, and the average difference estimated from twenty-four cars in ordinary winter weather was as high as 18°. Nor were these great variations of temperature all; in the same report above referred to there was not only a great variety of temperature in the same car, but a polluted atmosphere.

For example, Professor Howard found in his analysis of the air in car No. 319 (Pan Handle R. R.), which was a sleeper, and contained only twelve passengers, that the atmosphere in this car contained as high as 13.25 parts of carbon dioxide per 10,000—the highest in proportion to the number of passengers of any car examined—and at the same time there was a difference between the temperature at the bottom of the car and level of the head of 29°; and yet this car had all the ordinary provisions for ventilating found in the majority of such cars, and was heated by a Baker's hot-water heater, of which we found more in use than of any other kind.

Take another example: Car No. 356 (C. C. C. & I. R. R.) was a ladies' car, heated with a Baker's heater; one transom and eleven drop ventilators were open, and three analyses of

the air made; one at the front end, when twenty-nine passengers were in it, which showed 14.26 parts of carbon dioxide per 10,000; another at the middle of the car, when twenty-nine passengers were aboard, which showed 13.68 parts of carbon dioxide present; and, finally, one at the rear end, when there were twenty-seven passengers in it, which showed 11.53 parts per 10,000 of carbon dioxide present.

At the same time this car showed a difference of temperature between the level of the head and surface of the floor of 14°, with a variation of 6° between the extremes running and standing, with the mercury outside at 15° above zero.

These examples, which were practically duplicated over and over again in our investigations, certainly demonstrate without a question a decidedly improper system of heating and ventilating, and remove all questions as to why so many people take colds and contract severe acute diseases while travelling in our modern passenger coaches.

In these investigations we found that all provisions for the ventilation of passenger coaches were either at the top of the cars at the ends, by the windows or doors, excepting the constant supply of air that found its way in around both the single and double windows in all running trains.

Of the cars examined, 43⅛ per cent were ventilated with "drop sash" ventilators placed at the tops and sides of the cars and opening inward; 23⅛ per cent with "registers" placed along the top of the sides of each car; 13⅛ per cent with "side sash" ventilators placed at the top and sides of the car, and opening outward; 6⅛ per cent were ventilated with transoms at each end and top of the car; 13⅛ per cent had no ventilators at all.

In testing the currents of air circulating through these cars in the winter, we found almost a constant current of cold air coming in around the closed windows and descending toward the floor.

When the ventilators at the top of the car were open, the warm air at the top of the car rapidly escaped at these openings, and was replaced by a current of cold air, which rushed in at these same openings and rapidly fell to the bottom of the car, where it remained until sufficiently heated to again rise to the top and escape.

This process caused a constant out and in flow of air at

these openings, which was modified by the pressure of air inside the car, the motion of the train, and the currents of air outside.

The carbonic acid thrown off by the passengers, being much heavier than the air, would rapidly increase, and lay as a stratum of foul, cold air at the bottom of the car, while the warm, pure air would just as rapidly ascend to the top of the car and find a ready means of escape at the open ventilators.

In this way you will observe that it is easy to account for the extremely foul air in the cars above referred to, notwithstanding they were apparently well ventilated according to the methods now in use, which puts one in mind of the old story of a man trying to lift himself over the fence by his boot straps.

We have merely hinted at the obnoxious, unpleasant, and dangerous practice of ventilating coaches by an open window or door, for we think no sane person would advocate that method at the present time, especially in the winter season; and if the cars were properly constructed they would have no occasion to. To properly heat and ventilate a passenger coach is a grave question, and one that is much easier asked than answered.

The ideal heating of a passenger car is to keep all parts of the car at a given temperature (say 70° to 75° Fahr.) at all times while in active use. The ideal ventilating of a car is to remove all the foul air as fast as it is exhaled, and immediately replace it with pure fresh air. Then to properly heat and ventilate a car is to so combine these two as to keep a regular temperature at all times in the car, with a free supply of pure air, and at the same time be so constructed as to remove all the foul, cold air as fast as it accumulates at the bottom of the car.

The system that approaches nearest to these ideals, and at the same time will guarantee safety against fire or other injury to passengers in the event of a wreck, is simple of construction, durable, and economical, must sooner or later be adopted and put into practical use by our different railroad companies.

It seems to me that many of the grave objections above enumerated could be remedied and an approximate approach made, at least, in the direction of the ideal, by adopting a system something like the following:

In the first place, if the car is to be heated by steam from the engine, which by recent trials has been demonstrated to be practical as well as safe and economical, then have an air conduit built along each side of the coach, in the walls if you please, constructed of tin or some bright metal, and made air tight, through which the steam-pipes are to be conducted.

This air conduit should now be connected with a pipe leading from the air chamber of an air pump, from which a regular given pressure of air could be obtained. Immediately above this hot-air conduit should be a second air conduit or chamber, which should be supplied with air in the same manner as its fellow, but not to be supplied with steam-pipes.

These hot and cold-air conduits should now be connected by short connecting conduits between each seat, in which should be an opening leading into the car, and so arranged by stop cocks as to allow either hot or cold air, or both, to flow through this orifice into the car, as desired. (Just as you would turn on hot or cold water, or a mixture of both, in your bath-tub.)

There should be no ventilators at the tops of the cars at all, of any kind, but, instead, a foul-air register at the bottom, at each end of every car, large enough to allow the free escape of all the foul cold air into a suitable flue leading to the top and out of the car. In the second place, if the car is to be heated by individual heaters, I would recommend a system in which the fire-box of the heating apparatus would be enclosed in a boiler-iron case, placed underneath the middle of each car, which case could easily be constructed to serve as the outer wall of a hot-air chamber, as well as a protection against fire in case of an accident.

To this hot-air chamber could be attached one branch of the air-pipe leading from the air-pump on the engine; the other branch going to the cold-air conduit, while the warm-air conduit would be connected with this hot-air chamber and thus constantly be supplied with warm air.

By such a system you will readily observe that each seat would be supplied with a constant, fresh supply of either warm or cold pure air, or a mixture of both, by the simple turning of the stop-cocks opposite them, not only furnishing individual ventilation, which is so essential, especially in sleeping cars, but at the same time ventilating and heating

the whole car, regardless of external influences, the temperature of which should be regulated by stationary thermometers hung along the sides of the car, accompanied with printed instructions regarding the proper average temperature the car should be kept at.

By such a method it will readily be seen that a constant supply of pure air, at any desired temperature, coming into the sides of the car, would soon enable it to acquire an even temperature throughout, and by its pressure would constantly drive the cold foul stratum of air at the bottom of the car out through the foul-air ventilators, and thus not only heat, but ventilate the car perfectly and scientifically as well as practically, and at the same time avoid all unnecessary draughts from open windows, doors, or top ventilators, such as are now usually found in almost every coach you enter, whether first class or the lowest grade of emigrant cars.

Such a system of heating and ventilating would certainly have several advantages over the present plans now in use.

First. It would provide for an equal distribution of heat throughout the car, regardless of the weather outside, or whether the train be running or standing.

Second. It would furnish a constant supply of fresh air to each seat, regardless of the external atmospheric pressure or the direction the train be running as compared with the wind outside, and in such amounts and at such a temperature as desired, and at the same time avoid the very objectionable habit of opening the windows, doors, or ventilators for a supply of fresh air.

Third. It would secure a systematic removal of all the foul, cold air through the proper channel.

Fourth. In case steam heaters were used, it would be safer by encasing the pipes in the hot-air conduits, which, in the event of their bursting, would thus prevent, to a very great extent, the scalding of passengers, or if the cars were heated separately by individual heaters, be much safer than having stoves or heaters in each end of the car without any case or protection in the event of an accident.

Fifth. In summer time it would furnish a ready and economical method of cooling and ventilating the coaches, by means of this constant air pressure, and at the same time

avoid the dirt and dust so perplexing to travellers in warm weather.

If these few suggestions we have made, which were based on repeated and carefully taken personal investigations, crude and imperfect as they were, will only be the means of calling attention to and remedying in part even the heating and ventilating of our passenger coaches, I will feel that I am amply paid for all my trouble, and that my labors were not spent in vain.

(*Proceedings to be continued*).

EDITOR'S TABLE.

THE NAVAL MEDICAL SERVICE: REPORT OF THE SURGEON-GENERAL OF THE NAVY FOR 1887.

THE salient features of this report are that the services of the Medical Corps are of increasing comprehensiveness, and that, while it continues to sustain the highest standard of professional excellence in all its bearings, it is growing less and less attractive to those who are competent to enter it. This anomalous feature is well known to be due to the just pride of the Corps in maintaining its high professional standard, notwithstanding the continued effort of the officers of the line to degrade it by opposing all legislative action calculated to place it in the same relation to the officers of the line as the Medical Corps of the Army, by which it would doubtless prove equally attractive and speedily overcome the embarrassment which now obtains.

"There are now twelve vacancies for assistant surgeons. The loss of members in the active list of the Corps during the year amounted to nine officers; and only six assistant surgeons were appointed, one of whom has since resigned to enter the Medical Department of the Army."

Increased appropriations for the repair and preservation of several naval hospitals, especially with regard to drainage, are again urged.

The Naval Sanitarium at Penobscot Bay, the construction of which was provided for at the last session of Congress, is reported to be well-nigh complete and ready for occupation. The work was placed under the superintendence of Passed

Assistant Surgeon Heffenger, who has been very thorough in the exercise of his duty, and commends the work done by the contractors for its excellence.

Of the Insane of the Navy there remained in the Government Hospital for their care, in the District of Columbia, for the year ending September 30th, 1886, 60; admitted during the year ending September 30th, 1887, 9 : 69. There were discharged during the year—recovered, 6; improved, 1; died, 4 : 11. Remaining September 30th, 1887—officers, 7; enlisted, 51 : 58. In consequence of the want of accommodation for the insane at Napa, Cal., all of the insane of the Navy on the Pacific coast have been transferred to the Government asylums in the District of Columbia.

Whole number of persons examined for the naval service during the year 1886, 9568; number accepted, 5577; number rejected, 3991; color-blind, 84; rejected per thousand, 4.7+; color-blind per thousand, 8+.

Naval Apprentices.—Of 9929 different boys, ages fourteen to eighteen, candidates for appointment to apprenticeships in the naval service, examined by Assistant Surgeon F. J. B. Cordeiro, on the United States Receiving Ship Minnesota from July 1st, 1882, to October 1st, 1886, 6519 were rejected on account of physical disabilities. "In such a large number as 10,000 examinations, the probability is great that for any other 10,000 examinations of a similar character there will be a nearly equal number of disabilities occurring in nearly the same proportions."

REPORT OF VACCINATION.

No evidence of previous vaccination, 273 successful, 402 unsuccessful.

Presenting good cicatrices, 1160 successful, 2044 unsuccessful.

Evidence of former attack of small-pox, 63 successful, 163 unsuccessful.

SICKNESS.

Daily average number of sick, 204.69; daily average each case was under treatment, 8.81; admissions per 1000 of mean strength, 901.59; invaliding per 1000 of mean strength, 79.89; deaths per 1000 of mean strength, 5.42.

Ratios per 1000 of admissions for each class of diseases of the force afloat:

Zymotic diseases, 105.42; constitutional diseases, 99.46; diseases of the nervous system, 40.53; diseases of the eye, 10.95; diseases of the ear, 4.46; diseases of the teeth, 1.59; diseases of the circulatory system, 6.91; diseases of the respiratory system, 76.70; diseases of the digestive system, 164.57; diseases of the genito-urinary system, 84.46; diseases of the locomotive system, 4.04; diseases of the integumentary system, 89.78; diseases of the absorbent system, 24.25; non-malignant tumors and cysts, 1.48; poisons, 15.42; violent diseases and deaths, 171.38; feigned diseases, .10; total, 901.59.

It is an unfortunate omission—for the benefit of comparison—that a similar summary of the ratios per 1000 of admissions for each class of diseases of the force *ashore*, naval stations, etc., is not also given; and, moreover, the number of the respective forces.

Of the diseases of the respiratory system, of the force afloat, it is interesting to observe that of phthisis pneumonica *acuta* the total number of admissions was 6; 1 is reported discharged to duty and 5 to hospital. Of phthisis pneumonica *chronica*, the number of admissions was 31, in addition to 2 remaining from the preceding quarter; discharged to duty, 7; to hospital, 25; died, 1.

The Museum of Hygiene was removed to a more commodious building on July 1st last. The report upon the Museum, by T. J. Turner, Medical Director in charge, concisely states the advances made in the chemical examination of the air for sanitary purposes; the relations of the poison of cholera to the water supply in all the ports visited by our naval vessels; the composition of foods—showing their nutritive value in relation to the bulk of the articles which constitute the naval ration, and the difference in the average of water-free food between the ration in port and at sea—32.49 ounces in the former and 24.75 ounces in the latter.

The Naval Ration.—Referring to what he has elsewhere shown, in commenting upon the naval ration and the difference in the average of water-free food, Dr. Turner states that:

"This result is calculated from the chemical composition of

the food, and that long before its weight could be obtained by any process of desiccation physical changes occur rendering the food unfit for nutritive purposes. It is a matter of every-day observation on shipboard that dried vegetables especially do not regain their original sapidity when treated with fresh water, added for the purpose of restoring them to their normal condition.

"The fashion for the day in the matter of foods is in the use of the so-called peptonized, malted, soluble, etc., foods. Their use belongs in a great degree to therapeutics. Some experiments have been made in the Museum to determine from a physiological basis the nutritive values of foods. As the investigation progressed much was learned of the difficult nature of the examination, wherein the value of each condition had to be determined as influencing any series of observations," upon which he suggests a different "distribution of food, as well as the rearrangement of the meal hours more consonant with the physiology of the digestive act, and therefore more conducive to the health of the crew. At present the meal hours are as follows:

"Breakfast at 8 A.M.; dinner at 12 noon; supper at 5 P.M., and upon 'turning out an additional ration of tea or coffee and sugar.' It is evident that the men are from 5 P.M. until 8 A.M.—15 hours—without food, and that the bulk of the food is ingested in the remaining 9 hours of the day. Now, the digestive act is completed, in so far as finding the remains of the food in the stomach is concerned, in from two to three hours (Beaumont on Digestion), so that the men in the mid and morning watches often accused of 'loafing' and want of activity, affected with lassitude and a restless wakefulness, akin to morbid vigilance, are in this condition but giving physiological expression to the wants of the economy requiring food stimulation. This condition is a powerful factor in predisposing to disease, and the cumulative effects are seen in the depressed vitality of the sailor later on in his life.

"Considering the variety as well as the bulk of the ration, a proper distribution from careful study would be as follows: Dividing the whole ration into 9 parts, assign 3 parts for breakfast, 4 parts for dinner, and 2 parts for supper—'that is to say, breakfast to restore the waste, dinner to support during

the hours of active toil, and supper to carry on the functions of repair and secretion' (Letheby). This division, however, does not consider the fact of the loss of sleep in the night watches at sea, but as there is the turning-out meal and a suggestion as to the midwatch, it is believed to be correct both from a chemical and physical view.

"Again, it is known (Smith, "Cyclical Changes in Health and Disease") that after the ingestion of food, pulsation, respiration, and temperature rise, indicating more active functional work in the digestive act, and that this rise occurs within from two to three hours after a meal. It has also been observed that pulsation, respiration, and temperature are lowest from 3 to 6 in the morning. It would appear, therefore, that the ration on turning out has a physiological foundation.

"Reasoning from these facts, together with the known physical relations of food to work, it is suggested that by shifting the dog-watches from 12 to 2 and from 2 to 4, the following arrangement of the meal hours could be made, which does not interfere with the routine work of the ship: Continuing the ration as directed by law upon turning out, to have breakfast at 8 A.M., dinner at 2 P.M., supper at 8 P.M., reserving for the mid-watch, as they go on duty, a portion of the ration of tea or coffee and a biscuit.

"Thus the food of the sailor is served out more in accord with physiological requirement, the health and energy of the men are conserved and correlated, there is more immunity from disease influence, and so their efficiency for work is kept at its best standard."

As not foreign to this subject, the experience of a British officer at Gibraltar is mentioned. "Giving his troops a supper at 8 P.M., it was observed that a manifest decrease in the number of cases of drunkenness followed this salutary measure. The stimulus of food had supplied the desire for rum."

On the United States Naval Hospital, Philadelphia, Medical Director W. T. Hord reports that:

"The water supplied by the city is very bad, so much so, indeed, that every one who regards his health has it boiled and filtered. . . .

"The inmates of the hospital, with very few exceptions, are all beneficiaries; a class of men old, infirm, some totally

blind, others in the last stages of heart disease, others entirely paralyzed, some imbecile," etc., of whom there were in the hospital and asylum, January 1st, 1887, 200. "There were 77 between the ages of 60 and 70; 46 between the ages of 70 and 80; 11 between the ages of 80 and 90.

"The average age of the beneficiaries now in the asylum and hospital is 64.16 years. The average number of years they remain in the institution before they die is 8.57 years. . . .

"One would naturally suppose that the greatest number of deaths among these worn-out old men would be during the winter months, but, strange to say, the greatest number occur during the summer. I consider the reason of this to be that a large proportion of the beneficiaries are incorrigible drunkards, and as they are out on leave more during the pleasant weather than during the cold, disagreeable weather of winter, their opportunities for indulging in the use of liquor being greater, they consequently have more sickness and death among them."

On the United States Navy Yard, Portsmouth, N. H., Medical Inspector A. S. Oberly reports the marine barracks exceedingly defective with regard to ventilation and necessary conveniences, and overcrowded. "During seven months of the year the cesspit system of latrine is in use at the barracks, but during the rest of the time the men have to go to the water's side, which is quite remote. . . .

"There are now no bathing facilities at the barracks beyond what exists in the wash-room for hand and face washing. . . .

"The absolute need of a better hospital building at this station" is again urged as it has been repeatedly heretofore.

On the United States Navy Yard, League Island, Philadelphia, Surgeon W. H. Jones reports the general state of the health of the officers and men stationed there better than might reasonably be expected, considering the marshy nature of the ground.

"Rain-water has been used exclusively for drinking and cooking purposes. In the yard it is preserved in cisterns, and in the barracks on the Antietam in iron tanks."

On Cholera, Medical Inspector A. A. Hoehling, United States Flag-ship Pensacola, remarks "that cholera Asiatica may be speedily gotten rid of in an infected city by taking

radical means for obtaining pure water. By using only distilled water on board of our vessels of war we can keep cholera and enteric-fever from originating there. Of course, men going ashore on liberty may bring the diseases back; but the patients can usually be transferred to hospitals, and with simple means the spread of such diseases can be prevented There is usually a good deal of enteric-fever at Alexandria and Cairo, Egypt. Just now Alexandria is unusually free from the disease. The Nile water should never be used on board ships if it can be avoided, and if it *must* be drank should be boiled first. The British troops who tried to rescue General Gordon lost great numbers up the Nile from enteric-fever, and yet had no diarrhœal or dysenteric troubles worth mentioning. This may have been due to the sole use of *filtered* Nile water, the filter arresting the ferments and foul matters that usually cause ordinary bowel troubles, but not sufficing to arrest the bacilli of enteric-fever, which Pfeifer has now succeeded in cultivating separately on 'Koch's Agar-plates.'

"The fact is, even porcelain as a medium for filters will not render a liquid sterile; so we find it proven that bacilli cannot be removed by filtration.

"No ship of war should in the future be without means for artificial ventilation, electric lighting, and a *separate* boiler for distilling drinking water and running the ventilators, dynamos, and pumps to carry water from the tanks to the pantries and to flush the latrines, as well as to keep the bilges free from bilge-water. A large, square air-port has become a necessity which it would be superfluous to argue about. A good aerator and plenty of tank room for the distilled water are also admitted necessities. But the water-tanks ought to be lined with porcelain or some form of water-tight cement to get rid of iron rust."

Sporadic Typhoid-fever aboard ship.—Extracts from the report on the United States Steamship Quinebaug, by Surgeon J. Rufus Tryon, give an account of a remarkable development of this disease, which "gives rise to the question whether the disease can be traced to some probable local cause."

Six cases occurred within a period of six months, subsequent to September 2d, 1885.

"The health of the ship's company, with this exception, has been unusually good, and upon examination of the different parts of the vessel—head, bilges, hold, store-rooms, sick-bay, and berth-deck—nothing can be discovered to affect in any way the sanitary condition of the ship except the 'head.' This part of the vessel is entirely too small for the proper

accommodation of the number of men on board, and has not only always been a source of trouble to keep clean, but cases of rectal disease have been directly traced to its faulty construction, and the last case of typhoid may be due to some causes located there. The ship having been in continuous commission over seven years, this part seems to be thoroughly impregnated with impurities, over which cleanliness and disinfectants seem to have little control."

Nothing is said of the source of the water, hence it is to be inferred there was no reason to suspect it.

Ship Ventilation, as described by extracts from the report on the United States Steamship Dolphin, by Passed Assistant Surgeon James H. Gaines, has evidently made a long stride since the days of yore, when the writer of this review was impressed and *oppressed* with conditions which, according to Dr. Gaines's report, still obtain "on some vessels now afloat, where all special means for ventilation are absent, and where the bilge is ventilated into rooms on the berth-deck. . . ."

"The Dolphin is ventilated by artificial as well as by natural means. The two combined are ample.

"With some exceptions, which will be mentioned below, every living space below the main deck, in addition to the air-ports, doors, and hatches, is provided with at least two air-ducts—one for the admission of fresh air and one for the exhaustion of foul air.

"The system for aspiration consists essentially of three blowers in the fire-room, on a level with the berth-deck, and a system of air-ducts connecting them, with some few exceptions, with every room, passage, and living space below the main deck. The revolution of the blowers draws the air from the several apartments and delivers it in the fire-room. The blowers are driven by separate engines, capable of making 150 to 350 revolutions per minute, with an estimated capacity for delivering 720,000 cubic feet of air per hour in the fire-room.

"The fresh air is supplied through the doors, hatches, air-ports, and a system of air-ducts ranging in diameter from 2 to 3½ inches. The ducts open just under the rail.

"The after blower on the port side of the fire-room exhausts the air from the after part of the ship by one large air-duct, which extends to the extreme after part of the vessel, and as a rule is connected with every space by means of smaller ducts ranging in diameter from 2 to 3½ inches. It is placed under the berth-deck and immediately over the shaft-alley, and has a sectional area at blower of 324 square inches.

"The forward blower on the port side draws the air in a

like manner from the forward part of the ship by two large air-ducts placed on either side of the berth-deck, uniting, however, just before they reach the blower, with a sectional area at blower of 409 square inches.

"The blower on the starboard side draws the air from the coal-bunkers and engine-room, with a sectional area at blower of 57 square inches.

"There are, apparently, many avoidable angles in the ducts. As every right angle diminishes the velocity of the current of air one half, and renders them more vulnerable in case of working of the ship, the objection is worth considering.

"At present, too, there seems to be no provision for exhausting the air except into the fire-room. As it is only necessary in the fire-room when a forced draught is required, which will only be in cases of great emergency, and as the draught is seriously objectionable there, as will be shown below, it would appear to be a great oversight.

"While there are some serious objections to the details of the system, it is certainly more than a step in the right direction. . . ."

The average air-space in cubic feet is, for her complement of officers and men and per man, as follows: Cabin, 1 occupant, 5921.51; ward-room, 9 occupants, 4525.31, 502.81 each; berth-deck, 94 occupants, 7007. 68 each.

"The above is only approximate, and the total cubic air-space is exclusive of lockers, etc. The air-space per man is exclusive of 6 feet for hammock and individual."

THE FORTY-FOURTH ANNUAL REPORT OF THE NEW YORK ASSOCIATION FOR IMPROVING THE CONDITION OF THE POOR, FOR THE YEAR 1887, is, as ever, remarkable for its compact and unassuming statement of continuous work in the promotion of the comfort and health of that portion of the population which is the least able to help itself. We are told that "the year has been uneventful, though not without interest and success." And a few pages thereafter:

"Among the results achieved by the Association may be mentioned:

"The demolishing of eight old tenement-houses, totally unfit for habitation, and that have been allowed to endanger the public health for years."

Surely this is one of the most important events in the progress of tenement-house reform that has ever been recorded,

and one for which this Association more than any other body has done the most to promote. (All readers of THE SANITARIAN are familiar with its advocacy of tenement-house *destruction*, of, say, not less than ten of the worst every year, as *the* means, above all other, of improving the condition of those which are permitted to remain. Moreover, the reconstruction of tenement-houses over the same ground should be prohibited. They should be driven to cleaner soil in less densely built-up districts.) And this is by no means the only eventful work connected with the same subject during the year: "308 tenements have been thoroughly repaired, and the most offensive manure-dump has been abolished."

The details of tenement-house inspection follow and an abstract of relief statistics: 1100 visits; 13,666 personal visits to the homes of the poor; 55 frauds exposed; 6362 meals, and 2378 lodgings furnished.

Over 2600 women and children, and a few invalid men, were given the benefit of steamboat excursions and a day on the sea-shore during the hot weather—the excursions being one day each week and averaging about 100 souls each. "The enjoyment and appreciation of both mothers and children were sufficient to repay all labor and expense, aside from the marked physical benefits derived. The bracing sea air sharpened the appetites of old and young, so that when 'The Health Home' was reached the parties were in readiness to do full justice to the bountiful lunches always awaiting them."

Such is some of the "uneventful" work of this Association—

Whose objects are to promote whatever tends to the *permanent* improvement of the condition of the poor. It endeavors to reduce vagrancy and pauperism, and to ascertain their true cause; to prevent indiscriminate and duplicate almsgiving; to secure the community from imposture; to see that all deserving cases of destitution are promptly relieved; to make employment the basis of relief; to elevate the home-life, health, and habits of the poor; to introduce and encourage habits of thrift, saving, and economy; to aid in carrying out the laws relating to the health and cleanliness of the city, and to secure for the tenement-house population improved conditions of living; and

Its Support—voluntary offerings. Office, 79 Fourth Avenue, New York.

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* reports for the month of January, 1888, 73 deaths in a population estimated at 40,000, of which 17 were under five years of age, and representing an annual death-rate of 21.9 per 1000. From zymotic diseases there was 1 death; from consumption, 17.

CALIFORNIA.—The Secretary's report from 101 towns, for the month of January, indicates a higher death-rate than has obtained for many years. Deaths, 1225, in an estimated population of 686,300, giving an annual rate of 21.19 per 1000. The excess is attributed to the advent of small-pox, and the greatly increased number of deaths from acute pulmonary diseases—182 deaths from pneumonia.

"*Small-pox* continues to spread very slowly—224 cases with 27 deaths during the month in San Francisco; 30 of these were Chinese; 3 cases were reported in Sierra Valley; several cases with 2 deaths occurred in Sierra City, but there the disease has been checked; 2 cases and 1 death were reported near Downieville, and 2 cases at North Bloomfield. In Los Angeles 10 cases with 3 deaths were reported; 8 cases in Stockton, and 11 in San José. Dunsmuir had 2 or 3 cases; 2 were reported in Red Bluff, 2 in Redding, 1 in Delta, 2 in Sacramento, and 1 each in Castroville, Santa Rosa, Cloverdale, Santa Barbara, Yuba City, Riverside, Chico; 3 in Tulare, and 8 in Martinez. Of the 2 cases in Redding, Dr. Miller, of that place, writes that one of them was contracted through a dog carrying the infection in his hair to the child, who lived a quarter of a mile from the place where the first patient was quarantined. In Berkeley, of the 2 cases, 1 was traced by Dr. Payne, the Health Officer, to Oakland, where the disease was contracted in handling washing from the steamer Gaelic.

"With so many centres from which to radiate, small-pox cannot fail to reach in time every portion of the State, if preventive measures are not at once adopted to stay the pestilence. Eighty-nine years of constant trial having fully and unequivocally proven the value of vaccine virus as an efficient safeguard from the poison of small-pox, general vaccination should be resorted to in every city, town, and village in the State."

Pneumonia prevails to a greater extent throughout the State than ever before known; in San Francisco, Sacramento, San José, Napa, Los Angeles, and San Diego, it has been very prevalent; it is also noted in reports from Elsinore, Colton, Salinas, Santa Cruz, Downey, Fresno, Mariposa, Etna Mills, Colfax, Forest Hill, Elk Grove, Gridley, Anderson, Livermore, Tulare, Wheatland, Auburn, Lemoore, Camptonville, Berkeley, Benicia, Brownsville, Bakersfield, Chico, Marysville, Nevada City, Oroville, Santa Rosa, Stockton, Vallejo, Sissons, and Fresno. Bronchitis was likewise very prevalent during the month, although the type was not generally of a severe character. Measles is credited with 32 deaths; typhoid and typho-malarial-fevers, 53; diphtheria and croup, 50; scarlet-fever, 10; consumption, 170—13.8 per cent of the total number from all causes.

San Francisco reports for the month: Deaths, 636; from small-pox, as just above stated; acute lung diseases, 137; consumption, 89; typhoid-fever, 23; croup and diphtheria, 18; measles, 11; scarlet-fever, 3. Annual death-rate, 24.96. For the fiscal year, ending June 30th: Deaths, 5359; annual ratio (estimated population, 300,000), exclusive of Chinese, was 17.86, as against 5322 and 18.8 for the preceding year (Chinese population, 22,000, 22.18, as against 21 of the preceding year); 1418, 26.6 per cent, were of children under five years; 772, 14.41 per cent, were caused by consumption; 810, 15.11 per cent, by zymotic diseases; of these, by diphtheria and croup, 323; typhoid-fever, 145. The mortality from diphtheria was the largest since 1878. The continued prevalence of this *filth* disease is attributed by the Health Officer to the disgraceful condition of the sewerage system. In the progress of the work as at present conducted, "a brick sewer is frequently constructed to replace an old and decayed wooden one, but the fall being insufficient, you [the Board of Supervisors] are frequently substituting an elongated cesspool made of brick instead of wood." Of the present epidemic of small-pox, the first case was that of a white man, recently arrived from Texas, reported February 23d, 1887. During the interval to the closure of this report, June 30th, 19 other cases were reported; "but," says the Health Officer, "I have no fear of an epidemic. Isolation, vaccination with

bovine virus, thorough fumigation and destruction of infected clothing, bedding, and other articles, when necessary, I am satisfied will control the disease." The practical measures here suggested have evidently been greatly deficient.

The Quarantine Officer reports 9 vessels quarantined on account of small-pox during the year, and 8 cases removed from them.

CONNECTICUT.—The Secretary reports that the total number of deaths reported by 136 towns, comprising a population of 672,778, for the month of January was 1015, representing an annual death-rate of 18 per 1000 of population. In 29 towns, comprising a population of 40,622, there were no deaths. Every town in the State has reported the mortality excepting Essex, from which town only two monthly reports have been received during the eight months that this *Bulletin* has been published.

This is a larger death-rate than in any month since August. The increase is mostly in deaths from pulmonary diseases, pneumonia causing 133 deaths and bronchitis 38. Scarlet-fever is still prevailing throughout the State, and has been more fatal since the extreme low temperature. Diphtheria, too, maintains more than its average claim on children's lives, killing 67 in January, and only 56 in December. Cerebro-spinal-fever has also increased its fatality to 16 victims. Typhoid-fever, however, has proved less fatal, causing but 10 deaths against 22 of the preceding month.

New Haven.—Annual report for 1886: Population, 80,000; births, 2141; marriages, 765; deaths, 1392; 474, or 34.77 per cent, were of children under five years; 292, or 20.9 per cent, were caused by zymotic diseases, and 196, or 14.08 per cent, by consumption. Death-rate, 17.4.

DELAWARE.—*Wilmington*, annual report for 1887: Population, 57,000; births, 1132; marriages, 390; deaths, 1089; 448, or 41.13 per cent of the deaths, were of children under five years; 162, or 14.87 per cent, were caused by consumption. Deaths from zymotic diseases, as classified in the report, "156—14.33 per cent." But the incompleteness and imperfection of the summary under this head are exposed by such

errors as "croup, 12," while the same disease, in the alphabetical catalogue of causes, is credited with 38; cerebro-spinal meningitis is credited with 2, but not mentioned in the catalogue—yet there is there recorded, "cerebral meningitis, 7," and "meningitis, 41;" how many more than two of these, considering the very large proportion they bear to the total, is a question suggested by several other inconformities and omissions in the table. Moreover, the large number from such causes as "inanition, 25;" "marasmus, 48;" "general debility, 45;" "natural causes, 12," continue to show that, as we have before taken occasion to remark of other reports of this board, the death certificates to the Wilmington Board of Health, taking it for granted that they are recorded as rendered, are singularly deficient of useful information.

Small-pox was reported in the city November 10th, and from that time to the close of this report 11 cases had occurred. "How the disease was first brought to the city is not certainly known." Energetic efforts are in progress to stamp it out.

The sewerage and drainage of the city are still in abeyance, and the contamination of the water supply continues, as it has been for several years, a source of solicitude to the Board of Health, which is devoid of power in the premises.

During the month of January, 1888, there were 113 deaths, of which 46 were under five years of age. Annual death-rate, 23.7 per 1000. From zymotic diseases, 18; from consumption, 16.

ILLINOIS.—*Chicago* Health Department reports for the month of January, 1888, 1511 deaths in a population estimated at 840,000, of which 682 were under five years of age; representing an annual death-rate of 21.5 per 1000. From zymotic diseases there were 285 deaths, and from consumption, 124.

For the year 1886 (recently received): Deaths, 13,669, an excess over the previous year of 1225. Annual death-rate (population estimated at 704,000), 19.43, the lowest, excepting that for the previous year, 18.76, since 1881, when it was 25.69; 6763—49.36 per cent—were of children under five years. From zymotic diseases, 4169—31.16 per cent—the

chief of which were diphtheria and croup, 1303 ; diarrhœal diseases, 1182 ; typhoid-fever, 483 ; inanition, 305 ; scarlet-fever, 220 ; cerebro-spinal-fever, 103 ; other fevers under the same head, 122 ; measles, 122 ; whooping-cough, 112—to which may be added puerperal peritonitis, 89 ; metritis, 6 ; gastro-enteritis, 292 ; enteritis, 243, and tonsillitis, 4, which would swell the percentage from zymotic deaths from 31.16, as above summarized, or from 25.09—as given in the report—to 34.33. These large ratios of infantile and zymotic mortality, in conjunction with so small a death-rate, suggest a probable over-estimate of population.

Subordinate reports of tenement and factory inspectors, report of trades and occupations, of chemist, smoke inspector, etc., show a large amount of skilled labor under admirable executive direction.

Rock Island reports for four weeks ending January 28th, 1888, 12 deaths in a population estimated at 13,655, of which 5 were under five years of age. Death-rate, 10.4 per 1000. From zymotic diseases there were no deaths, and from consumption, 1.

IOWA monthly *Bulletin* reports for the month of January, 1888, the prevalence of measles throughout the State, with a good deal of fatality ; and recognizing its contagiousness, being scarcely less than that of small-pox, the State Board urges the most rigid quarantine of all cases and the closure of the public schools as necessary means for arresting its progress.

Davenport reports for the month of January 47 deaths in a population estimated at 30,084 ; 26 were under five years of age ; annual death-rate, 18.7 per 1000. From zymotic diseases there were 25 deaths ; from consumption, none.

LOUISIANA.—*New Orleans* reports for January, 1888, 356 deaths in 180,000 white population and 165 deaths in 68,000 colored population—making the respective death-rates 23.7 and 29.1 per 1000, and 25.2 for the whole population of 248,000. The deaths from zymotic diseases numbered 60, and from consumption, 77. There were 142 deaths under five years of age.

The City Council has recently adopted an ordinance requir-

ing the strict observance of all instructions and orders of the Board of Health prohibiting the exposure of persons affected with or persons who have died from infectious or contagious diseases; public funerals of any persons who die of such diseases; the carriage of any such persons or dead bodies in public conveyances; any children affected with such diseases, and any who recently have been so affected, attending public school until certified by a duly licensed physician to be devoid of danger to other persons, and requiring that all dead bodies shall be interred within twenty-four hours after death during the summer, and thirty-six hours during the winter months, unless permission is obtained in special cases from the Board of Health to withhold them from burial for a longer period. In the case of death from a contagious or infectious disease, the Board of Health shall be empowered to require and enforce the earlier burial of the corpse.

All sanitarians will regret to learn that Dr. JOSEPH HOLT'S health has become so impaired by the continuous labors and anxieties of the past four years' devotion to the duties of his office as President of the State Board of Health, as to constrain him to decline a reappointment for another official term. But it is reasonable to hope that the measures which he was the first to institute and which he has so successfully maintained against the introduction of infectious diseases by commerce at the port of New Orleans, during his four years' service, have become so thoroughly grounded in the public mind as to leave no risk of relapse into former merely passive measures; and that his successor, whoever he may be, may have a realizing sense of the *value* of unceasing vigilance and practical work—the maintenance of the public health—who can estimate it?

MAINE.—The *Sanitary Inspector* reports for the month of January, 1888, measles in several towns and the too-common neglect of restrictive measures against its prevalence. The attention of local boards of health is called to the law authorizing the display of red flags or placards on the entrances of infected premises, and urging the use of these and other preventive measures against the spread of measles, diphtheria, and other infectious diseases.

MARYLAND.—*Baltimore* Board of Health reports for four weeks ending January 28th, 1888, 642 deaths in a population estimated at 437,155; 255 were under five years of age. Death-rate, 16.5 per 1000. From zymotic diseases there were 85 deaths; from consumption, 66.

MASSACHUSETTS.—Report of the State Board of Health on Water Supply and Sewerage, January, 1888. The importance of this report is shown by the titles of the subjects of which it concisely treats—(I.) Advice to Cities and Towns: Water supply, disposal of sewage, pollution of inland waters, disposal of manufacturing drainage. (II.) Examination of Inland Waters: Taunton River, Charles River, Blackstone River. (III.) Purification of Sewage, experimental station: Recommendations, Reports of the Chief Engineer and of the Biologist. The Report is characterized by the thoroughness common to this State Board, and is of great practical utility to all communities who would maintain the purity of water supplies.

Boston.—Annual report of the Board of Health for the year 1887. Estimated population, 400,000. Total number of deaths during the year, 9268—25.18 per 1000, as against 23.17 for the previous year, and 24.04 in 1885; 1526, or 16.46 per cent, of the total mortality for 1887 was caused by consumption. Notwithstanding the relatively high mortality rate as compared with the seven other cities of the United States, excepting New York, severally of about equal or larger population, the percentage of infantile mortality was in Boston the smallest—36.35, as against 42.8, the average of the other cities. So, too, with regard to the percentage from zymotic diseases in the seven cities referred to, the rate was considerably higher in every one except Philadelphia, and the average 24.6; whereas in Boston it was 19.7. These differences are plausibly, at least, if not, indeed, reasonably, explained by the different estimates of population; every one of the other cities estimates a much larger percentage of increase, some of them two or three times as large. But, taking the percentages of mortality among children and from zymotic diseases as the most trustworthy measure of comparative healthfulness of population, Boston certainly excels any other city of

approximate population in the Union, as she does also in her thoroughness of sanitary administration.

During the month of January, 1888, there were 1043 deaths, of which 332 were under five years of age. Annual death-rate, 31.2 per 1000. From zymotic diseases, 131 deaths; from consumption, 139.

MICHIGAN.—The Secretary of the State Board reports for the month of January, 1888, compared with the average of corresponding months in the nine years 1879–87, the temperature was lower, the absolute humidity, the relative humidity, and the day and the night ozone were less. Compared with the average for the month of January in the nine years 1879–87, diphtheria, intermittent-fever, whooping-cough, consumption of lungs, pneumonia, bronchitis, typho-malarial-fever, and influenza were less prevalent in January, 1888.

Including reports by regular observers and others, diphtheria was reported present during the week ending January 28th and since at 25 places; typhoid-fever at 15 places; measles at 12 places.

Detroit.—The Health Officer reports for the month of January, 1888, 270 deaths in a population estimated at 200,000; 107 were under five years of age. Annual death-rate, 15.8 per 1000. From zymotic diseases there were 65 deaths; from consumption, 22.

MINNESOTA.—State Board *Bulletin* reports for the month of January: Diphtheria, 37 cases, 17 deaths; scarlatina, 10 cases, 2 deaths.

Diseases of animals: Glanders remaining isolated or not accounted for, 64. Reported during the month, 18; killed, 10; released, 5; remaining, February 1st, 1888, unaccounted for, 67.

St. Paul reports for the month of December 128 deaths in a population estimated at 150,000, of which 66 were under five years of age, and representing an annual death-rate of 10.02 per 1000. From zymotic diseases there were 41 deaths, and from consumption, 9.

Minneapolis has an epidemic of winter cholera, "not unlike the cholera morbus of the summer months. It affects all

classes, chiefly adults, and has proven fatal in several cases. . . . So far as the causation and prevention are concerned, from a sanitary standpoint, plans are being arranged whereby the State Board will assist the local Board in the investigation. . . ." And to this end a circular of categorical questions calculated to elicit the fullest information with regard to the nature and prevalence of the disease has been distributed to the physicians of the State.

St. Paul Board of Health reports for the month of January, 1888, 133 deaths in a population estimated at 150,000; 54 were under five years of age; annual death-rate, 10.5 per 1000. From zymotic diseases there were 35 deaths; from consumption, 14.

MISSOURI.—*St. Louis* Health Department reports for the month of January, 1888, 864 deaths in a population estimated at 420,000; 293 were under five years of age; annual death-rate, 24.6 per 1000. From zymotic diseases there were 172 deaths; from consumption, 87.

NEW JERSEY.—*Newark* Board of Health reports for the month of January, 1888, 354 deaths in a population estimated at 168,191; 144 were under five years of age. Annual death-rate, 25.28 per 1000. From zymotic diseases there were 75 deaths; from consumption, 33.

Paterson Board of Health reports for the month of January, 1888, 184 deaths in a population estimated at 69,000; 81 were under five years of age; annual death-rate, 33.3 per 1000. From zymotic diseases there were 43 deaths; from consumption, 20.

Annual report for the year 1887: Deaths, 1505; 703—46.71 per cent—were of children under five years; 355—23.52 per cent—were caused by zymotic diseases. Of these, diphtheria and croup caused 64; scarlet-fever, 88; typhoid-fever, 16, and diarrhœal diseases, 131; 189—12.55 per cent—were caused by consumption.

NEW HAMPSHIRE.—Sixth Annual Report of the State Board of Health, for the fiscal year ending April 30th, 1887. The progress of practical sanitation is remarkably well shown

in this report by the clearness with which it describes the relations of typhoid-fever and other intestinal diseases and diphtheria to polluted drinking water and filthy soils; the sensitiveness of milk to filthy surroundings, as well as danger from adding polluted water; the danger of milk from diseased cows; the ill effects of badly situated, overcrowded, and unventilated school-houses; how consumption may be reduced by better attention to the nutrition of children and the purity of the atmospheric surroundings, in-doors and out; the danger of waste matter; the benefits of physical education. All these descriptions suggest remedies for the most part within the comprehension, and easy of application by all intelligent persons. The report throughout is eminently practical and worthy of the widest possible distribution among the people.

Registration Report, for the year 1885, gives the statistics of population, births, marriages, divorces, and deaths. The registration of births is confessedly incomplete; additional legislation is suggested to render it complete in the future. The number, respectively, for the year, was as follows:

Population (1880), 346,991; births, 6319; marriages, 3180; divorces, 291; deaths, 6201. Rates per 1000 of population: Births, 18.21; marriages, 9.16; deaths, 17.87. Of the causes of death: Zymotic diseases, 809; constitutional diseases, 1271; local diseases, 2637; developmental diseases, 848; violent deaths, 656. Of the whole number, 1434 were under five years of age; 152 were caused by croup and diphtheria; typhoid-fever, 124; meningitis, 135; measles, 45; scarlatina, 53; whooping-cough, 25; diarrhœal diseases, 100; consumption, 857—12.21 per cent of the total from all causes.

Manchester reports for the month of January, 1888, 87 deaths in a population estimated at 41,000, of which 37 were under five years of age. Annual death-rate, 25.4 per 1000. From zymotic diseases, 10; from consumption, 11.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 129 towns of 3000 inhabitants and upward, comprising a population of about 3,500,000, for the month of January, 1888, 8742; of which 32.5 per cent were under five years of age. In each 1000 deaths there were 176.75 deaths from

zymotic diseases ; of these 8.92 were from diarrhœal diseases ; 7.32 from typhoid-fever ; 30.31 from scarlet-fever ; 100.55 from diphtheria. In January, 1887, the ratio for these four diseases, respectively, was 10.16, 9.38, 13.16, and 52.93. Scarlet-fever has increased in prevalence each month since September last ; diphtheria maintains about the same prevalence—nearly three-fourths of the deaths from zymotic diseases were from these two diseases. Of the 21 deaths from small-pox, 1 occurred in Albany and 1 in Springwater, the rest in New York and Kings counties ; the only new outbreak during the month is reported from Gravesend, the origin of which is traced to Brooklyn, a suspected case being, however, also reported from Morristown, St. Lawrence County. In each 1000 deaths, 313.32 occurred from consumption, zymotic, and puerperal diseases (328.43 in December) ; 124.57 per 1000 were from consumption alone. From acute respiratory diseases there were 178.78 deaths per 1000 total mortality.

New York City, for the same month, population, 1,526,081 : Deaths, 3435, representing an annual death-rate of 26.90. Deaths under five years, 1328, 38.6 per cent of total from all causes. From zymotic diseases : Cerebro-spinal meningitis, 11 ; typhoid-fever, 12 ; malarial diseases, 26 ; small-pox, 4 ; scarlet-fever, 120 ; measles, 28 ; erysipelas, 18 ; whooping-cough, 25 ; croup and diphtheria, 340 ; diarrhœal diseases, 37 ; zymotic diseases per 1000 deaths from all causes, 183.40. Consumption, 459 ; acute respiratory, 768 ; puerperal diseases, 40.

Brooklyn, 757,755 : Deaths, 1589 ; death-rate, 24.70 ; deaths under five years, 566—35.6 per cent of total. From zymotic diseases : Typhoid-fever, 6 ; malarial diseases, 23 ; small-pox, 2 (cases reported during the month, 71, with 11 deaths in small-pox hospital) ; scarlet-fever, 58 ; measles, 3 ; erysipelas, 8 ; whooping-cough, 4 ; croup and diphtheria, 196 ; diarrhœal diseases, 15 ; zymotic diseases per 1000 deaths from all causes, 197.80. Consumption, 187 ; acute respiratory diseases, 353 ; puerperal diseases, 21.

Buffalo, 202,818 : Deaths, 340 ; death-rate, 20.12 ; deaths under five years, 140—41.2 per cent of total. From zymotic diseases : Cerebro-spinal meningitis, 2 ; typhoid-fever, 1 ; malarial diseases, 1 ; scarlet-fever, 9 ; measles, 4 ; erysipelas,

1 ; whooping-cough, 1 ; croup and diphtheria, 50 ; zymotic diseases per 1000 deaths from all causes, 202.95. Consumption, 40 ; acute respiratory diseases, 46 ; puerperal diseases, 9.

Rochester, 110,000 : Deaths, 177 ; death-rate, 19.28 ; deaths under five years, 52—29.4 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 5 ; croup and diphtheria, 16 ; diarrhœal diseases, 2 ; zymotic diseases per 1000 deaths from all causes, 130.00. Consumption, 26 ; acute respiratory diseases, 29.

Albany, 96,000 : Deaths, 208 ; death-rate, 26.0 ; deaths under five years, 59—26.0 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 4 ; small-pox, 1 ; scarlet-fever, 5 ; croup and diphtheria, 16 ; diarrhœal diseases, 2 ; zymotic diseases per 1000 deaths from all causes, 164.62. Consumption, 34 ; acute respiratory diseases, 21.

Syracuse, 78,000 : Deaths, 121 ; death-rate, 18.61 ; deaths under five years, 44—33.0 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 2 ; malarial diseases, 3 ; scarlet-fever, 4 ; measles, 12 ; erysipelas, 1 ; croup and diphtheria, 16 ; diarrhœal diseases, 1 ; zymotic diseases per 1000 of total, 325.00. Consumption, 13 ; acute respiratory diseases, 20 ; puerperal diseases, 5.

Lowest Death-rates : The five cities or towns of the State of 10,000 inhabitants and upward having the lowest death-rates during the month of January were : Binghamton (25,000), 14.40 ; Oswego (24,000), 15.50 ; Auburn (26,000), 15.70 ; Schenectady (20,000), 16.20 ; Yonkers (27,500), 16.57.

Highest Death-rates : The five cities or towns of the State of 10,000 inhabitants and upward having the highest death-rates during the same month were : Long Island City (21,000), 33.14 ; Poughkeepsie (20,200), 31.48 ; New York (1,526,081), 26.90 ; Albany (96,000), 26.0 ; Jamestown (14,000), 25.71.

OHIO.—The Monthly Record reports the number of deaths from the returns of 35 towns of 1200 population and upward, comprising a population of 984,200, during the month of January, 1538 ; annual death-rate, 18.76 ; deaths under five years, 525 ; from zymotic diseases, 328—the chief of which were croup and diphtheria, 127 ; typhoid-fever, 54 ; diarrhœal diseases, 21 ; whooping-cough, 17 ; measles, 12 ; cerebro-

spinal meningitis, 11. Consumption, 87; pneumonia, 185. Of the total from zymotic diseases, 123 occurred in Cincinnati —41 from croup and diphtheria, and the same number from typhoid-fever.

The *highest* death-rates were in Miamisburg (3000), 32; Youngstown (16,000), 31.50; Bellevue (3500), 27.42; Akron (30,000), 24.49; Ravenna (4000), 24. The *lowest* death-rates were in Wellington (2000), 6; Defiance (7000), 6.85; Urbana (8000), 7.50; Cuyahoga Falls (2800), 8.55.

PENNSYLVANIA.—*Philadelphia* Board of Health reports for four weeks ending January 28th, 1888, 1664 deaths in a population estimated at 993,801; 487 were under five years of age. Death-rate, 28.2 per 1000. From zymotic diseases there were 176 deaths; from consumption, 206.

Pittsburgh Board of Health reports for three weeks ending January 21st, 1888, 253 deaths in a population estimated at 200,000; 87 were under five years of age. Death-rate, 20.2 per 1000. From zymotic diseases there were 29 deaths; from consumption, 18.

TENNESSEE.—The State Board *Bulletin* reports the principal diseases named in the order of their greater prevalence in the State, for January: pneumonia, catarrhs, typhoid-fever, bronchitis, malarial-fever, rheumatism, consumption, tonsillitis, and dysentery. Measles was reported in the counties of Anderson, Blount, Bradley, Carroll, Crockett, Davidson, Fayette, Franklin, Gibson, Humphreys, Lake, Lawrence, Lewis, Marshall, Maury, Moore, Obion, Overton, Shelby, Stewart, Sumner, Washington, and Wayne. Whooping-cough in Bradley, Cumberland, Gibson, Humphreys, Knox, Maury, Overton, Robertson, and Shelby. Mumps in Anderson, Coffee, Franklin, Hancock, Marshall, Maury, Moore, Stewart, Sullivan, and Washington. Scarlet-fever in Coffee, Crockett, Davidson, Fayette, Knox, Marshall, Rutherford, Shelby, and Williamson. Diphtheria in Davidson, Hamilton, Knox, Maury, and Shelby. Roseola in Crockett, Decatur, Gibson, and Williamson. Cerebro-spinal meningitis in Maury and Washington. Chicken-pox in Maury, and erysipelas in Decatur.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows:

Chattanooga,	white,	11.00;	colored,	25.84 :	16.21
Clarksville,	"	12.00;	"	28.00 :	18.00
Columbia,	"	20.00;	"	12.00 :	16.80
Knoxville,	"	13.86;	"	50.47 :	21.38
Memphis,	"	23.57;	"	35.14 :	27.72
Nashville,	"	11.18;	"	25.72 :	16.39

The *meteorological* features for January were marked by no special features except the remarkable sleet of the 15th–16th, which remained on the ground for ten days in most parts of the State. There were no very high winds reported except at Greeneville, and only one thunder storm, which was confined to the western division. The percentage of cloudiness was large, and while the temperature was always above zero, the month was generally a very disagreeable one.

The mean temperature was 37.8°, about 4° above the normal for the past five years. The highest temperature was 74°, recorded on the 6th and 7th; the lowest 10.74° below zero. The ranges of temperature were generally less than usual, but in one instance—at Nashville, on the 15th—the daily range was 45°, a very unusual range.

The mean precipitation for the month was 4.47 inches, about one inch less than the January average of the past four years, and the least during that period.

VERMONT has organized a State Board of Health.

VIRGINIA.—*Richmond* Board of Health reports for the month of January, 1888, 181 deaths in a population estimated at 100,000; 62 were under five years of age. Annual death-rate, 21.7 per 1000. From zymotic diseases there were 12 deaths; from consumption, 23.

WISCONSIN.—*Milwaukee* Board of Health reports for the month of January, 1888, 269 deaths in a population estimated at 185,000; 60 were under five years of age; annual death-rate, 17.4 per 1000. From zymotic diseases there were 45 deaths; from consumption, 25.

SMALL-POX, as will be seen above, is epidemic in San Francisco and extending throughout California; continues in

Brooklyn, but is less prevalent since the closure of the report for January. In New York it also continues to crop out occasionally, declaring its continued presence.

Abroad, as summed up from the latest reports received, February 25th, during the *four weeks* ending on that date, the number of deaths reported from small-pox were in :

London, 1 ; Manchester, 6 ; Leeds, 5 ; Sheffield, 98 ; Bristol, 4 ; Paris, 38 ; Lyons, 2 ; Havre, 15 ; Rheims, 2 ; Amiens, 3 ; Munich, 1 ; Trieste, 14 ; Louvière, 10 ; Nivelles, 3. During the *three weeks* ending February 18th : Vienna, 6 ; Pesth, 3 ; Prague, 68 ; Warsaw, 19. During the *month of December*, Milan, 41 ; Genoa, 41. During the *month of January*, Madrid, 91 ; Saragossa, 4 ; Marseilles, 16 ; Bordeaux, 3 ; Nantes, 3 ; Nice, 7 ; Besançon, 1 ; Livourne, 5 ; Bombay, 37 ; Cairo, 5. From Surgeon-General Hamilton's Weekly Abstract, February 17th to March 16th : Havana, during the *month of February*, 140 ; during the week ending March 3d, 20. Cienfuegos, during the *four weeks* ending February 27th, 153 ; Guayaquil, 58 ; Sagua la Grande, 18. Buenos Ayres, during the *month of December*, 95.

CHOLERA, according to the most recent reports—Surgeon-General Hamilton's Abstract :

"*Buenos Ayres.*—The United States Minister, in his despatch, dated January 12th, 1888, states that cholera has appeared at Salta. 'In the past three days there have been 20 cases and 7 deaths. The Government has sent a number of physicians there with a full supply of medicines. Salta is a city of 40,000 inhabitants, located near the 24th parallel, 10° north of Buenos Ayres, and not far from Bolivia. It is a beautiful place, 3780 feet above the sea-level, and at times inundated by the Arias and Silleta rivers, which is always followed by malarial fevers. It is regarded very unhealthy generally.'

"*Callao.*—The United States Consul, in his despatch dated January 25th, 1888, states that 'the latest cholera reports from Chili show a falling off of the disease at Santiago, and a slight increase at Valparaiso and the southern ports. The most unfavorable statement refers to the appearance of two cases of the epidemic at the city of La Serena, a short dis-

tance inland from Coquimbo to the northward of Valparaiso. This is the only indication of a deviation in the course of the disease, which had been proceeding steadily in a southwardly direction. Here the interdiction of all vessels from Chilian ports is still vigorously maintained, and last week a British man-of-war, the Hyacinth, from Arica, was refused admittance, although official interference was resorted to. Steamers arriving from Panama, and touching at Guayaquil, are subject to five days' quarantine of observation, owing to the appearance of yellow-fever at the last-named port. The public health of Lima and Callao continues to be satisfactory, and no cases of cholera or yellow-fever have made their appearance on the Peruvian coast.' ''

LITERARY NOTICES.

ATLAS OF VENEREAL AND SKIN DISEASES. By PRINCE A. MORROW, A.M., M.D., Clinical Professor of Venereal Diseases; formerly Clinical Lecturer on Dermatology in the University of the City of New York; Surgeon to Charity Hospital, etc. Imperial folio atlas, to consist of fifteen parts containing seventy-five chromo-lithographic plates, containing several hundred figures, many of them of life size, in flesh tints and colors, together with descriptive text for each plate, and from sixteen to twenty folio pages of a practical treatise upon venereal and skin diseases; the whole to form one volume. In the composition of the work, besides Professor Morrow many of the most distinguished authorities on the subjects treated of have been secured as contributors; among them Kaposi and Neumann, of Vienna; Hutchinson, Fournier, and Hardy, of London; Ricord, Cullerier, Besnier, and Vidal, of Paris; Leloir, of Lille; Keyes, Fessenden, and Piffard, of New York; Hyde, of Chicago, and others.

Parts I. and II., before us, comprise the Introduction, and the following plates: (I) Chancroids, Phimosis and Paraphimosis, Varieties of Chancroids, Chancroids, Phimosis and Paraphimosis, Chancroids of the Female Genitals, Mixed Chancre, Chancroidal Bubo-Suppurating and Gangrenous; (II.) Chancroids and Chancres, Lymphitis, Chancroids, Balanitis, Chancres, Digital Chancres, Erratic Chancres of the Eyelids, Lip,

Tongue, Cheek, etc., Vaccination Chancres, Initial Lesion, with Maculo-Papular Syphilide; with descriptive text. And, judged by these parts, the work when finished will certainly be one of the most complete, as it will be one of the most important and useful works of the kind hitherto published. It will be sold by subscription only, at $2 per part. New York: William Wood & Company.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES—AN ATLAS AND TEXT-BOOK COMBINED. By GEORGE HENRY FOX, A.M., M.D., Clinical Professor of the Diseases of the Skin, College of Physicians and Surgeons, New York; Professor of Diseases of the Skin, Post-Graduate Medical School and Hospital, New York; Physician to New York Skin and Cancer Hospital; Fellow of American Academy of Medicine; Member of the New York Dermatological Association, etc. Second series, complete in twelve parts. Hand-colored plates; nearly one hundred cases from life. 4to. To be published in twelve monthly parts, $2 each. New York: E. B. Treat. Parts III. and IV. of this admirable work, now before us, comprise: (III.) Eczema rubrum et squamosum, Eczema squamosum (2), Eczema intertrigo, Eczema faciei (2); (IV.) Eczema barbæ, Sycosis barbæ, Trichophytosis barbæ, Eczema squamosum, Eczema syphiloderma, Dermatitis exfoliativa, Psoriasis guttata. These fasciculi fully justify the favorable view of the work which we expressed in a previous number.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By JOHN V. SHOEMAKER, A.M., M.D., Professor of Skin and Venereal Diseases in the Medico-Chirurgical College and Hospital of Philadelphia; Physician to the Philadelphia Hospital for Diseases of the Skin; Member of the American Medical Association, of the Pennsylvania and Minnesota State Medical Societies, of the American Academy of Medicine, and of the British Medical Association; Fellow of the Medical Society of London. 8vo, pp. 741. With Colored Plates and other Illustrations. New York: D. Appleton & Company.

This work comprises the gist of an extensive mass of literature on the subject of which it treats, from the standpoint of a general practitioner with excellent opportunities for study and observation with a view to the best practical results, which are herein so concisely expressed as to render it one of the

most perspicuous manuals on the subject of which it treats that has fallen under our notice. The plates are exceedingly characteristic. Indeed, they are so to a fault—too emphatic. That is to say, they are too exclusively confined to the illustration of extraordinary or bad cases of the diseases they represent, and hence less useful than they would have been by representing cases of less intensity.

The most prominent feature of the work throughout is, in conjunction with a correct diagnosis, *treatment;* not, by any means, in the multiplication of remedies, but by the evident care taken to eliminate much that has been found useless heretofore, and to utilize that which has been found useful in extensive, practical, personal observation. Besides numerous formulæ in context, over fifty pages are exclusively devoted to "Formulary," with which the volume concludes.

THE BROOKLYN MEDICAL JOURNAL, the special organ, and edited by a committee, of the Kings County Medical Society —Drs. Joseph Raymond, Alexander Hutchins, Joseph Hunt, G. R. Butler, and F. D. Bailey—first appeared with the current year under unusually favorable auspices: an abundance of material, an evidently large home patronage, and a specially competent editorial staff. It is very artistically gotten up, eighty-four pages text, and chock full of matter of interest to all physicians. To be published monthly, $2 a year. The Brooklyn *Medical Journal*, 214 Madison Street, Brooklyn, N. Y.

THE AMERICAN JOURNAL OF PSYCHOLOGY. Edited by G. Stanley Hall, Professor of Psychology and Pedagogics in the Johns Hopkins University. Pp. 182. Quarterly. $3 a year. Baltimore, Md. The first two numbers of this journal, before us at the time of this writing, very fully demonstrate the great scope there is for such a periodical, by presenting such matter as cannot fail to interest a large and increasing class of persons interested in the subject. The Relation of Neurology to Psychology, by Henry H. Donaldson, Ph.D.; Insistent and Fixed Ideas, by Edward Cowles, M.D., and A Critique of Psycho-Physic Methods, by Joseph Jastrow, Ph.D., in No. 2 (February), are specimens.

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THE PHYSIOLOGY OF THE ROGUE.*

By AUSTIN ABBOTT, LL.D., New York.

IN responding to the invitation of your President to read a paper on the well-worn subject of Criminal Responsibility as Affected by Mental Condition, I propose to take advantage of the opportunity to put before you some questions which appear to me to be yet unanswered, or, at least, not sufficiently answered. They are questions which the present state of the law suggests for the consideration of the medical profession.

We all understand the main point now in controversy between Law and Medicine.

The law holds that one who has capacity to distinguish the nature and quality of the act, or to distinguish between right and wrong, in respect to the act, at the time of committing it, is criminally responsible.

Medical men generally hold that one who has that capacity may still lack the power of self-control, and that one who, even knowing the act to be wrong, commits it from uncontrollable impulse, is not criminally responsible.

The law says nothing about disease, mental or physical. It simply inquires for the mental capacity to distinguish between the right and the wrong of the act. If that capacity existed, neither ignorance nor disease is a defence. There is only one limitation on this inquiry for the capacity to distinguish—viz., the case of a child under seven years. The law presumes that under that age such capacity to distinguish cannot exist, and refuses to listen to evidence that the child had such capacity.

* Read before the Society of Medical Jurisprudence and State Medicine, New York, February 9th, 1888.

Medical men usually, if not uniformly, look to disease as the test of irresponsibility, and they inquire not only whether disease has impaired the power to distinguish between the right and wrong of the act, but also whether it has impaired the power of self-control.

The question of mental disease comes up before the law merely as matter of evidence or opinion which may lead to the conclusion of incapacity to discern the nature or wrong of the act.

I may remark in passing that this points to a distinction of the first importance to medical witnesses and to counsel presenting insanity as a defence. In the present state of our law, uncontrollable impulse may be made a defence, but only in one way—viz., by showing that the impulse deprived the accused for the time at least of the capacity to distinguish the nature or the wrong of the act. Counsel and expert witnesses not unfrequently fail to present the legal aspect of the defence because of ignoring this perhaps subtle distinction. The medical witness may say: "His impulse was an insane impulse; it was uncontrollable; it was irresistible; he had no power over his will; he was not responsible; he was absolutely insane." But this is not enough. To make this uncontrollable impulse enough, the witness must go further in his opinion and show that it not merely silenced the reason or prevented the accused from considering the distinction between the right and wrong, but that it took away for the time being his capacity to distinguish. Probably many experts would say that in their view the two are one and the same; that an impulse which prevents one from being conscious of a distinction, in effect takes away the capacity to distinguish. But in legal effect the two statements are not the same. The law establishes the defence upon adequate opinion evidence that the impulse took away the capacity to distinguish; it overrules the defence upon evidence that the impulse only prevented the exercise of that capacity.

We all anticipate the time when more complete investigation of mental functions will remove this difference of opinion.

I desire to point attention this evening to some of the important questions which now stand directly in the path of these investigations, and to urge the necessity of enlarging the field of inquiry so as to include physiological as well as pathological

conditions—the eccentric action of an undiseased organization as well as the morbid action of a diseased organization. I ask you to consider for a few moments what we may call

The Physiology of the Rogue.

I use the word "rogue" because I wish to direct attention not only to the graver criminals, but to all those varied classes of unregulated lives from which chiefly the criminal classes are recruited. I would include all classes of offenders against good order in society—not only the criminal strictly so called, but also the vagrant, the crank, the tramp, and the dead beat.

I use the word "physiology" because I wish to direct attention beyond the question of disease on which the present medical jurisprudence of criminal responsibility turns, and to inquire what physical defects or modifications short of disease are scientifically recognizable as characteristic of these offending classes, and what relation those qualities bear to legal responsibility.

Do not physiological characteristics *demand* attention in a scientific investigation of the conditions of crime, if we would arrive at an intelligent discrimination of the physical grounds of criminal irresponsibility?

The increasing light which medical investigation is throwing upon the operations of the nervous system encourages us to believe that the time is near at hand when human conduct may be observed and described with scientific clearness, and when practical results of the utmost value in dealing with the criminal and the unfortunate classes will be secured through the discrimination in their treatment which such knowledge will dictate.

The same observation and skill that have measured with approximate accuracy the force expended by the vital functions of a man in mere existence for twenty-four hours, apart from work done, and that have also measured the speed with which nervous excitation moves along its channels, and even the relative speed of different nervous functions, and have begun to demonstrate the localization of the functions of the brain, promise yet to answer in a most convincing way the questions which the Law puts to Medicine as to the relation of the condition of the nervous system to crime.

Let us consider some typical instances.

First, the Tramp.

The tramp appears to be one variety of that great class of offenders the key to whose character is found in diminished and unbalanced or incomplete nervous activities. The nerves of sensation or the centres of the spinal cord and brain which should respond to the nerves of sensation are depressed, sluggish, dull. The sensations of cold, wet, of naked skin and bare feet, make little impression; the irritation of filth and vermin—all these things are not enough to arouse the brain to energy and the body to activity. Rather than earn the money to pay his fare or his lodging, he will ride smothered in the dust under a freight-car, or sleep in a dry-goods box or on the sidewalk grating over a warm cellar. Foul smells do not annoy, stale victuals do not disgust, sour beer does not excite aversion. That part of the nervous system which serves the lungs and the digestive system appears to be in excellent order. The appetite is admirable; he is no dyspeptic. The respiration is vigorous, and commonly through the dull, inert-looking skin a ruddy circulating system shows itself. The tramp appears to be a man of good bone and muscle, who has fallen out of the ranks of civilization because the inadequate amount of nervous activity he possesses is nearly all employed in what have been called the vegetative functions, leaving not enough for intelligent cerebration or even the ordinary reflex actions necessary for such industry as would keep his bones and muscles in any productive employment.

His characteristic offences are those of a sturdy brute; he breaks fences, tramples down the meadow, rifles the pantry, assaults or frightens women, pollutes the path, and fouls the spring. There is no danger that he will commit forgery. His nervous forces are not adequate to the work of a counterfeiter. There is not life enough in his brain to carry him into the perpetration of a commercial fraud or even a confidence game. The crimes of ingenuity and skill he has no mind for. Crimes of passion are, with but occasional exceptions, above his sluggish level; and the exceptions are those which are committed when the vigorous wants of his vegetative functions impel him to an unusual effort, or a refusal to minister to them awakens an ill-will, which, in respect of intelligence, is only a few degrees above that of a vicious beast.

This man was not always a tramp. What determined his development?

I have offered this imperfect description as another form of inquiry rather than an answer to the question it suggests.

Second, the Dead Beat.

I take these familiar and very unscientific names because they constitute well-recognized types of offenders who are within the observation of all of us, and because I hope to draw forth from those better able to instruct us some more accurate delineation.

The dead beat appears to be another variety of the same great class of offenders having, perhaps, diminished and unbalanced or inadequate nervous force. Like the tramp, he lives in his appetites, but, unlike the tramp, his nerves of sensation and of motion are in lively condition. That part of the nervous system which in the tramp is depressed, in the dead beat manifests rather an exalted sensibility. His keen appreciation of all the pleasures of the senses—of epicurean delicacies, of perfumes, of the beauty of a *boutonière*, and the bouquet of fine wines, the luxury of toilet soaps and new gloves, make a curious contrast to the stolid indifference which his brother the tramp manifests. He lives in the sensations which these and other such things afford. But they do not awaken in him the intelligence or the volitions necessary to come by them honestly. He has a mental sensitiveness which prevents him from helping himself to them by force as the tramp does. But he takes them by indirection. He has just mental capacity enough to contrive his way to self-gratification through the effort to make himself agreeable and plausible, to borrow, to wheedle, to flatter, cozen, and cheat.

Third, the Crank.

The crank appears to be one of the same great class of offenders the key to whose character may be sought for in diminished and unbalanced nervous activities, but he belongs to a very different variety from those already mentioned. The crank does not appear, like the tramp, to be a well-nourished man. He does not expend all his nervous force in the vegetative functions. Nor does he live so largely in his sensations as the dead beat. On the contrary, the activity of his force seems centred in the brain, but there appears to be not enough of it to arouse all the cerebral functions that should

act together. He thinks, here and there, without the balance which can be given only by the united and well-proportioned influence of the nervous centres as a whole. It is not for me to enter upon the question of the localization of function in the brain, but assuming, as I may, that there is some such localization as is now believed, the conduct of the crank is just that which would result from a predisposition to cerebral activity in certain special directions, and a characteristic inefficiency in all other inhibitory centres. He is bright and unbalanced, quick and unrestrained.

The tramp lives in his appetites, without the aid which a sensitive organization gives to securing selection and preparation of desirable food and drink and lodgings. The crank lives in his ideas, without the aid to judgment—and therefore without the check to conduct—that comes from the proper co-ordination of ideas. There seems to be no characteristic depression of the sensory and motor systems, such as marks the tramp; and if we imagine that in any person of lively susceptibility the organization, or habitudes, or a diminution of nervous force caused the excitations of the brain to be confined in a greater or less degree to special centres and channels, without the modifying influence which would come through a proper co-ordination of the surrounding inhibitory centres, the resulting conduct one would suppose to be just such as the crank manifests. His mental disposition is aptly expressed by the common phrases, narrow, unbalanced, unrestrained. More force in the same channel might only enhance the quality which we call crankiness; more force expended in collateral lines and centres, it may be supposed, might reduce his mental processes to common sense.

It will at once occur to you that it may not be right to infer a depressed state or deficiency of nervous force as a cause for this unbalanced action in the case of either of these classes. I have used that suggestion as proper to give definiteness to the description I have attempted, but it is obvious that a structural or functional inaptitude of some nerve centres to bear their share in a general activity might be an equally plausible suggestion.

However this may be, the offences characteristic of the crank are those of folly acting in the realm of intelligence, or

perhaps it would be more appropriate to say those of intelligence acting without appropriate inhibitory restraint. They are the offences which manifest intelligent desire and intelligent adaptation of means to end ; and, moreover, it seems to be true in general that the characteristic desires of the crank and the means he devises involve only such thoughts and feelings as are or may be common to the minds of many thinking men ; but, nevertheless, they are such as the mind of one not a crank would discard at the first thought as inhibited by something beyond or collateral. Every thinking man probably has at times impracticable ideas, and his wisdom consists in part in the judgment by which he recognizes their impracticability or impropriety.

Hence the characteristic offences of the crank are those of erratic intelligence. He has an exaggerated activity and intensity in ideas common to other people, but which in other people are restrained by an inhibition that in him seems to be lacking. His crimes are those of schemes, disjointed ingenuity, ambition isolated from the conditions of success, a supposed heroism that would be heroism if acting in union with the other elements that should restrain and direct it, but which without them is a criminal intent.

How did this man become a crank? Is this a disease, or is it only the result of a special nervous habitude in an otherwise undiseased organization?

These suggestions are put forth as inquiries in a domain which has not yet been explained, and the investigation of which seems necessary before the law can accept the medical doctrine of irresponsibility.

If some investigator would study men of such classes as these, and the inebriate, dipsomaniac, the kleptomaniac, and others equally interesting, and delineate their organization and habits with that patient fidelity to nature that Darwin and Lubbock have used in reference to lower forms of life, we should have new light upon the questions on which medical jurisprudence now halts.

Uncontrollable Impulse.

This brings us to the topic on which such light is wanted for the purposes of criminal law—the topic of uncontrollable impulse and crimes of frenzy. There are several reasons why

the law has not yet accepted the doctrine of medical men on this part of the subject.

First, the protection of society forbids accepting uncontrollable impulse as a defence in itself until further provision is made for the care of the subjects of such impulse. If those medical men who are the strongest advocates of treating irresistible impulse as a defence were put in charge of the administration of justice in this community, under full responsibility to preserve peace and order, and with power to do whatever was necessary for that end, through the police force and the judicial and penal establishments, it is safe to predict that they would not begin by setting free from arrest every accused who convinced them that he acted in a condition of unconsciousness or without the power of controlling himself. It cannot be doubted that medical men, if they were given the authority and the means, would soon devise and apply appropriate measures of restraint, discrimination, and treatment which would put many who are now classed as common criminals into the class of insane; but meanwhile it can hardly be doubted that they would continue, out of necessity for the protection of society, to enforce the present rules of law.

Let me illustrate this without further discussion by mention of two cases, with which you are doubtless already familiar. On Cole's trial, which took place in Albany, 1868, on indictment for the murder of Hiscock at Stanwix Hall, the defence was that he was frenzied by information that the deceased had seduced his wife.

The judge fully explained to the jury the rule which I have already stated as to the capacity of the accused to comprehend the nature of the act, but also in figurative phrase directed the jury to inquire whether at the moment of the killing "his reason was dethroned." He not only told them to ask, "Did the accused understand the nature of the act in which he was engaged so as to understand whether it was right or wrong?" but he added: "Was his reason dethroned or operative?" The jury, after consultation, came into court to ask further instructions in regard to insane impulse and ungovernable frenzy. The judge responded by emphasizing not only the ability to discriminate between right and wrong, but the consciousness or actual exercise of that ability at the time. He

said: "The question, after all, is whether he had his mental powers and the ability to exercise them to such a degree as made him conscious, at the time, of the nature of the act in which he was engaged." The jury again retired. Subsequently they came into court, and the foreman stated they found the prisoner to have been sane at the moment before and the moment after the killing, but they were in doubt as to his sanity on the instant of the homicide.

The judge told them, in effect, that they must give the prisoner the benefit of the doubt, and they rendered a verdict of not guilty.

I do not know what would be the general opinion of medical men on this case; but the general opinion of jurists is that it is not only unsound, but extremely dangerous.

The unsoundness in point of law consists in the holding that it is enough if *actual consciousness* of the quality of the act was for the moment excluded. The rule of law is, that if the *capacity* to distinguish remains, the fact that passion or frenzy, however caused, prevented the exercise of that capacity, is irrelevant.

The unsoundness, in a medical point of view, appears to consist in ignoring all distinction between physiological and pathological conditions, and inferring disease from the mere fact that impulse was so strong that reason did not at the same time act.

This case, the unsoundness of which in law is, I believe, universally conceded, illustrates again the point I have already adverted to, that counsel for the defence and the medical expert must look to the question whether the impulse deprived the accused of the capacity of distinguishing rather than merely preventing its exercise.

The other case to which I would call attention is one tried in the Court of Sessions, in Brooklyn, last December—the indictment of George Weidler for the murder of Dr. E. H. Duggan. The following testimony I take from the fullest report in the daily papers of that day, that of the *Herald* of December 2d, 1887.

William Meyers, an uncle of the prisoner, who has a paper-box factory on Wythe Avenue, Williamsburg, said: "George is quick, nervous, and excitable. He is just like me—I don't

know what I am liable to do if anybody strikes me. When I was twenty-one I was troubled with vertigo and saw all sorts of spectres. I was suffering from malarial fever, and George had the same disease five or six years ago."

District-Attorney Ridgway then asked : " Are you engaged in any other business than the making of paper boxes ?"

" I decline to answer," was the reply.

" On the ground that it would incriminate you ?"

" Yes."

" Is that the business in which Weidler was engaged with you ?" continued the prosecuting officer.

" I decline to answer on the same ground," was the reply.

" Did Weidler carry a pistol at your request ?"

" Yes ; I told him to do so in order to protect my money. He collected bills for me, and frequently went through the north side, where they will knock you down with a lead pipe for a little money."

The medical testimony on behalf of the accused was to the effect that " Temporary insanity might suddenly arise and suddenly disappear. . . . Under the circumstances testified to, and assuming them to be true, the man was insane at the time of the shooting."

The prisoner was convicted, notwithstanding, or perhaps I might say by the aid of, this testimony. If the accused had been proposed for admission into an asylum these facts might have justified or required treating him as insane. But I am sure that if the most skilled alienists were transferred from their duties of hygienic treatment of insanity to the position of directors of the police and administrators of the criminal law, they would apply the rule of law that was applied in this latter case until better means for the protection of society from uncontrollable impulse should be provided.

Second. Another underlying reason why the medical view fails to secure legal recognition is this lack, or, at least, imperfection, of evidence that uncontrollable impulse is the result of disease. We constantly see by medical testimony that medical men infer disease from misconduct. This the law can never do. Here is a radical and essential difference between principles of evidence applicable in legal investigation and those applicable in medical treatment. The physician, whose

object is curative, must often infer disease from misconduct. The law, whose object is responsibility, can accept disease as disproving criminal intent in misconduct, but it can never regard the misconduct itself as sufficient sole evidence of the disease which disproves it.

Third. There is a deeper reason why the law does not recognize uncontrollable impulse as a defence, a reason to be found in the history of the development of the sense of justice among men. So far as the development in mankind of the capacities of knowledge of right and wrong and of self-restraint is due to external influences, it is largely due to the fact that the law has punished men irrespective of whether they actually knew the quality of the act, and irrespective of whether they could control their impulse. In other words, the punitive methods of the law have been the means of developing that capacity which otherwise would not have existed, or would have existed in a far less degree.

We are not now considering the important subject of the power of religion to awaken the mental activities which supply the deficiencies of which we are speaking, and thus equalize these inequalities. But we may illustrate the development of control by what we see in the case of animals and children. A dog, unbroken, manifests uncontrollable impulses. The smell of meat awakens an impulse, the sight of it intensifies the impulse ; hunger may make it overpowering. Now the course of development by which this uncontrollable impulse is to be reduced to control is a course of punishment. The same is true of children. The distinction between animals capable of domestication and those which are not appears to consist, largely at least, in the capacity of domesticated animals to have powers of restraint, inhibition, or self-control awakened into activity in the nervous centres by the punishment of acts otherwise done under uncontrollable impulse.

An examination of the history of criminal law from its rudest beginnings to its present position would show that the order of development of justice and good order among men is punishment first, and knowledge and self-restraint coming thereafter and thereby. As I have said elsewhere, " the law, therefore, does not postpone the punishment until after those qualities are possessed, but establishes it as a means of awaken-

ing those qualities.* I believe that the qualities of self-restraint which mark the highest grade of civilized character have come to men largely through the existence and administration of the penal sanctions of law, against those who, but for such penal sanctions, would have had much less capacity of distinguishing right and wrong, and, in a physiologic sense, no power to restrain the impulses of nature. If this be so, the way to increase immensely the mischiefs of uncontrollable impulse in the community is to put an end to punishment for acts committed under uncontrollable impulse; and the way to increase those faculties by which men control impulse is to maintain the punishment which the law inflicts for criminal acts, irrespective of the attempt to prove such impulses as in themselves a justification or excuse. It may well be that the time will come when penal justice will be put on a better footing, but the refusal of the law to recognize such justification or excuse is made in view of the present imperfect adaptation of tribunals of justice to the investigation of uncontrollable impulse, and, we ought to add, in view of the present condition of society. I do not think that medical men appreciate, generally, the power which the existence of the law and its penal sanctions exercise on the lawless in aiding the control of what would otherwise be uncontrollable impulse. Those who are familiar with the administration of law, those who are charged with its administration, those who have the responsibility of maintaining peace and order will not, I think, deem it an exaggerated statement to say that, in all probability, if the assistance to self-control which comes from the existence of the penal law were taken away, New York would be a ruin in a week, from what would, without those sanctions, be called the uncontrollable impulses of reckless, lawless, and criminal classes."

I do not deny that if in so far as lack of self-control in any case be shown to be the consequence of disease, a proper case for intervention against punishment is made clear. The law, in its present attitude, only waits for such knowledge as shall make it safe to discriminate between such impulses as man-

* It is related that at the assizes held by Mr. Justice Byles on one of the English circuits, a prisoner indicted for theft was defended by medical testimony that he was subject to kleptomania. "Yes," said the judge, "that is what I am sent here to cure."

kind must acquire the power to control through discipline, and such as are the result of disease.* But the difficulty here is, as I have already pointed out, that the law must be furnished with some evidence of disease besides the misconduct itself.

Several practical suggestions result from these principles.

At present convicts of all these classes, with convicts whose offences were deliberate and intelligent, and with those who are inexperienced, having yielded to a first temptation, are poured together into one common place of confinement. Vagrants, habitual drunkards, pickpockets, and confidence men, young men and young women making their first misstep in life, the reclaimable and the irreclaimable, are still to a great extent herded together. The general charge of vagrancy, to say nothing of other offences, brings an immense mass of this misery into the same category. The law cannot stop this process by admitting the defence of irresponsibility, nor can it safely, even for a single season, turn loose upon the community those who destroy its peace and safety from any cause.

Ought there not to be systematic medical supervision, conducted by experts in what we may call the physiology and pathology of crime, for the purpose of sifting these masses of offenders, and securing for those of each class the treatment proper for them, irrespective of the particular offence which brought them into custody of the law.

Second. Considering that under the present law many offenders of graver classes must be undergoing punishment in whose cases mental condition is an element, and considering also the extent to which mental condition ought to influence the exercise of the pardoning power, and the increasing need for some non-political arrangement in regard to the exercise of that power, should there not be a board of clemency composed of jurists and alienists, who should systematically investigate from time to time the condition of all convicts, with appropriate powers for the relief of cases not fit for the punishment awarded?

Third. Is it not time to adopt a better method of trying the

* To this should be added reference to the recent statements, on high authority, of the lack of control resulting from suggestions received while in the hypnotic state.

question of insanity? Two methods have been suggested for this purpose, each of which has its advantages.

The one most discussed thus far among us is that of official experts. If this method were adopted, should there not be a State board of expert witnesses at the service of district attorneys—men who should be selected either by civil service methods, or by choice from among those of a defined length of experience in charge of asylums, or as professors of appropriate departments in medical schools, and of sufficient standing and experience? The mode of selection should be such as to command the universal confidence of the medical profession. The members of this board should respond whenever called by the prosecution, and it might be optional also with the defence to call them. I cannot doubt that the result of the investigations and of the testimony of such authorities would very soon advance the medical doctrine of criminal responsibility, and greatly enlarge the influence of medico-legal jurisprudence in reference not only to this but also to other subjects.

Another plan for trying the question of insanity is now under consideration in England—a plan formulated by Mr. Everest,* an English barrister. He says: "Let a skilled physician, appointed by Government, go the rounds of the jails periodically before quarter sessions and assizes, and send those cases in which there is a suspicion of insanity before a special tribunal, for the purpose of trying the question of insanity, and that only. Let this tribunal be composed of a judge and common jury, the judge being a lawyer of eminence. Let standing counsel be employed on either side, whose duty it shall be to examine or cross-examine the witnesses, and let the judge have an absolute discretion as to the admissibility of evidence. . . . If the jury find the prisoner insane so as not to be responsible for what he has done, then he will, of course, be sent to a criminal lunatic asylum. If they find him not insane, then he will be sent back for trial before the ordinary tribunal, when he will have the same advantage of any defence, technical or otherwise, as the other prisoners."

* The Defence of Insanity in Criminal Cases, an Essay by Lancelot Fielding Everest London: Stevens & Sons, 1887.

In conclusion, I observe that the immense advantages which society has experienced from the extension of medical supervision to the sanitary condition of the community, suggest the parallel advantages that might be gained for criminal jurisprudence if in some such ways as those I have mentioned the future investigation of the physiology and pathology of crime could be carried forward on a broad and effective scale with official authority, and results gathered which would be a safe guide in modifying the present rules as to the criminal responsibility of persons of imperfect vital force or diseased organization.

Prisons, poorhouses, and asylums should be organized, under medical direction, on civil service principles, and utilized for the systematic investigation of the physiology and pathology of pauperism, insanity, and crime, to the end that the laws may be made more humane and more efficient, that all who are reclaimable may be restored, and society permanently protected against the incorrigible.

RELATIONS OF PHYSICIANS TO THE BOARD OF HEALTH AND HEALTH LAWS.*

By Lewis Balch, M.D., Albany, N. Y., Secretary of State Board of Health of New York; Professor of Anatomy, Albany Medical College.

Owing to a seeming misunderstanding that prevails to a certain extent among physicians as to the meaning and intent of regulations issued by the Board of Health, I have considered that some explanations of the objects sought by the Board, and of the duties required under the law of it and of physicians, might be of use to the profession and aid in a more complete and easy working of the rules of the Board.

In chapter 297, Laws of 1885, entitled "An act for the preservation of the public health and the registration of vital statistics in the city of Albany," subdivision 3, section 2, states as one of the duties of the Board: "To guard against

* Read before the Medical Society of the County of Albany, Wednesday evening, November 2d, 1887.

the introduction of contagious and infectious disease, by the exercise of proper and vigilant medical inspection and control of all persons and things arriving in said city from infected places, or which, for any cause, are liable to communicate contagion; to require the isolation of all persons or things infected with or exposed to contagious or infectious disease, and to provide suitable places for the reception of the same; to prohibit and to prevent all intercourse and communication with or use of infected premises, places, and things; and to require, and, if necessary, to provide the means for thorough purification and cleansing of the same before general intercourse therewith, or use thereof, shall be allowed. To provide at stated intervals a suitable supply of vaccine virus; and during the existence of an actual epidemic of small-pox, said local Board of Health shall obtain fresh supplies of said virus at intervals not exceeding one week, and shall at all times provide thorough and safe vaccination for all persons within its jurisdiction who may need the same."

It will be noticed that by this section the Board is charged with the full protection of the public health, so far as the question of contagious and infectious diseases is concerned. But unless aid is given the Board by those who are supposed to have the health of the community in their charge, and who are as desirous of preventing disease as they are of attending those suffering from it—the physicians of the city—it is an impossible task for the Board to have knowledge of every case of contagious disease, or to take such precautions against its spread as may be thought most efficacious. Some doctor is called to attend nearly every case of contagious disease that appears. Therefore, the Board has passed an ordinance requiring physicians to notify the health officer when any case of such nature may come under their notice. The ordinance is equally binding upon parents or guardians, but the Board takes for granted that medical men have as great, if not greater, interest than any others in preventing an epidemic, besides being by education qualified to pronounce upon whether a case may or may not be contagious.

I regret to say that this ordinance is but poorly lived up to by the majority of physicians. They act as if it were something of the least importance, and when they think of report-

ing, well and good ; but if it goes by for some little time, and the case gets well or dies, why, it is no matter in the first, and the death return reports the case in the second. One physician argued that it was all nonsense, that he could quarantine a case as well as the health officer, and knew as much about such work. Another objected on the ground that he was not going to "give away where his practice was ;" another, that no compensation was allowed for such arduous labor as the sending of a note or postal to say a case of contagious disease existed in such and such a quarter of the town. Many more objections of a like trivial character are argued. But all alike are puerile and senseless. That the medical men of Albany all understand as well as the health officer how to quarantine, fumigate, and take all proper and needed precautions for the protection of the public health, is not for a moment disputed. But the law confers upon the health officer the power, through the directions of the Board, to impose a quarantine which, if broken, can be punished by fine. The quarantine directed by order, therefore, of the official becomes of more force than one imposed by the attending physician, whose orders may be broken without the risk of penalty. Serious harm may be done by a late report. Last Friday a case died of malignant scarlet-fever. As soon as I heard of it a private funeral was ordered and measures taken to disinfect. Yesterday another was reported, and to-day the patient is dead. Investigation proved that this second one had visited the first and there contracted the disease. Had the first been early reported to the office and proper quarantine observed, the second would probably have not occurred.

It is objected that even if cases are reported, nothing is done by the health authorities. It has been the custom where well-known doctors report cases, and state they have taken all precautions, that the will fumigate and disinfect, to allow them to conduct the case without a visitation from the health office. All physicians to whom I have spoken on the subject will, I think, remember that it has always been said that if they needed the official dictum of the Health Board to enforce their order, or if they wished the premises fumigated, they have but to notify the office and all aid will be extended them that lies in the power of the Board.

Finding, however, that this action of the health officer has been misunderstood, orders have been issued that all cases reported are to be visited by an inspector and the general rules of the Board explained. As regards fumigation, if physicians prefer to do it themselves, they will have to, hereafter, notify the health office of the fact; otherwise the inspectors will fumigate in every case where it has come to the office that a patient has recovered or dies of contagious disease.

In answer to the objection that the service of reporting these cases should be paid for, I would say that we are all required to do many things by law for the doing of which the law provides no compensation. This objection could have no weight as a defence supposing a physician to be fined by the Board for neglecting his duty.

The section of the sanitary code requiring these reports has been twice distributed about the city to doctors, printed on postal cards. Full care has, therefore, been taken to give publicity to this regulation, for, in addition to the cards, it has been published in the daily papers. Ignorance of the law is no excuse in law, and to plead ignorance of the section calling for reports of contagious diseases, after all these efforts made to call the attention of physicians to the rule, is a plea that cannot be received by the Board.

But what are the contagious diseases that must be reported? Small-pox, chicken-pox, measles, typhus-fever, scarlet-fever, diphtheria, and cholera.

Cholera is not contagious from the person, but, owing to its virulence and highly infectious character, it is put upon the list.

Chicken-pox is also called for. There is but little, if any, danger even from an epidemic of this disease, but it is so like the outbreaking of small-pox, and is apt to prevail at the same time as small-pox, that every precaution must be taken to prevent the accidental confusing of the two diseases. During the prevalence of small-pox three winters ago, much excitement was caused by a sensational report published in one of the papers that the health officer was neglecting his duty, and that the public were exposed to an epidemic of small-pox, as one of the employés in a large dry-goods house was permitted to attend his business, while at home his child lay ill with

variola. The doctor who was in charge of the case had reported it as chicken-pox, and I had upon careful examination confirmed his diagnosis, before the reporter startled the town by his flaming head-lines.

Measles, on account of similarity to small-pox, as well as because it may have serious results, is listed.

Typhus-fever, for its own danger. Scarlet-fever and diphtheria, because, being highly contagious, at the same time they are highly virulent.

The Board will shortly issue postal sheets to physicians, printed in form and with printed directions, to simplify and facilitate reporting contagious diseases. This will save the expense of postal to doctors, but after they have been distributed the resolution of the Board directing the health officer to enforce the provisions of the code, fining those not reporting, will have to be rigidly carried out.

Section 5 of the law before quoted puts upon the Board as one of its duties the registration of vital statistics, as the registration of births, marriages, and deaths. The code requires those attending professionally at a birth or death to fill out the certificate of such birth or death, and undertakers are required to obtain a permit to bury before they can inter a body.

The law reads: "Any person neglecting or refusing to make out or file for registration any record aforesaid (referring to births, deaths, and marriages), or as provided for by the ordinances of the said Board of Health, and any person causing, permitting, or assisting in the burial or removal of any dead body, unaccompanied by a permit for such burial or removal, and any officer who shall neglect or refuse to register and preserve the said records shall be deemed guilty of a misdemeanor, and may be prosecuted in any court of competent jurisdiction."

The ordinances require that return of births shall be made in three days. This time will, by resolution of the Board, be lengthened to a week. Some physicians now are in the habit of waiting until their birth returns make a goodly number, and then sending them to the office, either not thinking or not caring whether they obey the order of the Board or put the registrar to extra trouble by delayed returns.

Undertakers complain that physicians do not fill out death

returns when they are presented, but make them call two or three times before they can get the certificate. This is hard upon the undertakers, who cannot move a body before a permit is issued, and cannot get a permit unless upon the return of a death. Owing to this delay on the part of physicians, undertakers frequently violate the ordinance which requires them to obtain a permit twenty-four hours before the funeral.

And the filling out of the death certificate is a matter to which your attention is asked. The cause, or probable cause, of death must be stated.

Will any doctor here please tell me what is a "natural cause of death"? Many certificates are brought bearing that as the cause of death. Permits to bury will be refused upon such certificate, on the ground that the certificate is not filled out as required by law, and does not state the cause or probable cause of death. If by a natural cause is meant heart disease, typhoid pneumonia, asthenia, old age, or what not, let that be stated, and not the absurd ambiguity of "natural causes."

The registration of vital statistics is an important matter. Copies are constantly asked for—how often can only be known by one conversant with the work. Proof of death may be wanted for insurance, claiming pension, establishing the fact of the death at a certain time. Unless physicians make returns, the records cannot be kept with that exactness expected and called for by the law.

The Board will do everything in its power to protect the public health, but it calls for, and is certainly entitled to, the cheerful aid of all physicians practising within the limits of its jurisdiction. Not alone in the reporting of contagious or infectious disease is this aid looked for, but in reporting unsanitary conditions that are or may become a menace and danger to life and health. While the officers of the Board try to watch over the public health, and do all they can to render places and localities more healthy, it is a physical impossibility for them to know every place needing attention, and physicians can be of material help in adding to the health of our city by sustaining the efforts of the Board and strengthening its hands. —*Albany Medical Annals.*

WHAT PRINCIPLES ARE TO BE RECOMMENDED FOR THE INSTITUTION OF AN INTERNATIONAL REGULATION OF EPIDEMICS.

AT the late meeting of the International Congress of Demography and Hygiene at Vienna, Dr. Sonderegger made the following report on this question :

1. All regulations directed against the spread of epidemics rest on the belief in the existence of contagion.

2. In order that the contagion shall reach active development, favorable conditions of time and place are indispensable. The duty of hygiene is to study the general local receptivity for epidemic diseases, to hinder the development of the contagion ; the task of sanitary police is to hinder the entrance of the contagion, and once it has entered to destroy it. If one of these two tasks be executed with the exactitude of physical experiment, the other becomes easy, often useless. But if it is not so, it is a fatal error to think that a regulation of sanitary police, however perfect it may be supposed to be, can be of any service as long as public hygiene is neglected. Hygiene exceeds in importance in time of war as in time of peace, in epidemics as in endemics.

3. The bacteriological discoveries of our epoch have not impaired in any way the value of the predisposition of time and place ; on the contrary, they have completed it. The formerly unknown force which brought about the explosion of an epidemic in an infected region has now become visible and tangible.

What we call regulation against epidemics relates almost exclusively to the natural history, to the vital consideration of the living contagium, which in accordance with its specific nature is susceptible of multiplication and migration.

4. The means of communication in our age have manifestly narrowed the globe, the nations have been drawn together, their reciprocal interchanges have become vastly more impor-

tant and frequent. These interchanges do not apply to works of the intellect alone nor to the productions of a country and its industry, but especially to the men themselves. The native of any country whatever has become, in a very appreciable measure, a citizen of the world.

5. As to the objects that may become the vehicle of contagion, they travel now with sufficient rapidity to transport the necessary active germs from one country to another; man in particular requires less time to traverse even a very extensive country than a contagious malady, of which he carries the germ, requires to spring into activity.

6. For this object, all the frontiers up to our time have been inefficient for the arrest of the germs of epidemic disease, and efforts made with that view, by the creation of sanitary cordons, have been absolutely useless, and in the majority of cases have been positively injurious.

Complete interruption of all intercourse, hermetic sequestration against the gravest epidemics is a Utopia. This fact is no longer debatable.

7. All measures which restrict to a single country precautions against an epidemic are most frequently insufficient, and that above all in proportion to the importance of the relations of that country and the extent of its frontiers. To attempt to enforce sanitary police regulations in small States or in particular provinces is veritably Utopian.

In large countries, in Italy, 1884, in Spain, 1885, and hitherto in Russia, in Austria, in Germany, in France, and in England, epidemics remain often stationary for a whole year at a time, and in spite of all interchanges of people and merchandise have not encroached upon neighboring nations. It is because the soil is not everywhere morbific at the same time, and that the inhabitants are not all at the same time in a state of receptivity. It is for this reason that the greater part of contagious maladies come to be epidemic and seldom come to be pandemic. To-day the conditions of contagion are exactly known; but the predisposing conditions, the time and the place, they are not so well known. We cannot, therefore, at all know whether an epidemic will remain limited to a single country, and whether neighboring people will remain exempt. Consequently, outside of special sanitary police ordinances in

the contaminated country, an international sanitary police is necessary. Its organization as regards time and expense would cost infinitely less than the loss in men and values caused by an epidemic of moderate intensity. Commerce and ordinary political enterprises run much greater risks, with the promise of much smaller gains.

8. All countries in the outset ought to possess a central bureau of public health. But this bureau ought not to be outside of the current of relations which unites all people of the world. In our day a sanitary police intended to guard against epidemics is efficacious only on condition that it is international.

9. The first obligation is to determine and publish each case of an epidemic or contagious malady. Every physician should be required to do this, and when it relates to a disease easily recognizable, as small-pox or cholera, every master of a house or head of a family should be subjected to the same obligation. These publications should be sent to the central bureau of the district or the country in the most rapid manner possible. It should be the duty of this central bureau (*a*) to inaugurate special suitable measures and to insure their execution, (*b*) to advise directly or indirectly all the central bureaus of the other countries of the continent. Immediate publication by means of the daily press is unnecessary, for it alarms the popular masses, and, furthermore, if the sanitary service is well organized it will have no influence on the taking of efficient measures. It is only when an epidemic has reached an extensive development that the daily publication of the number of cases and the mortality becomes legitimate, and that purely for psychological reasons, with a view of restraining the panic.

(10.) The tenth obligation is the immediate and complete isolation of the diseased, who may transmit the contagion. For this purpose every important locality ought to have prepared in advance a well-regulated organization and a plan for isolation with necessary material and attendants.

(11.) In the eleventh place, a service of great watchfulness ought to be organized for the entire population, as yet free from the disease, (*a*) in the locality where the epidemic begins; (*b*) in all centres of commercial transactions. Ships and seaports ought to be kept in strict surveillance in the greatest

state of purity, in order that they may not become centres of infection. In each commercial centre stations of observation ought to be established as asylums to receive the diseased or those who may be suspected of being so, and who shall be pointed out by the employés of railroads and ports and by the physicians of vessels. Quarantine which applies to all travellers is injurious from every point of view. It should be authorized for twenty-four hours or more for the purpose of facilitating observation.

(12.) Twelfthly, provision ought to be made at the very outset for the disinfection of the probable vehicle of contagion—that is to say, in the case of cholera, (*a*) disinfection in the very chamber of the patient and not in privies and water-closets. In cases of small-pox, typhus, and the pest, disinfection and, if possible, incineration of the clothing and other objects used; finally, disinfection of the patient himself by ablutions and baths. The old method of the disinfection of travellers by fumigation, so religiously maintained, ought to be formally prohibited as constituting an absolutely useless vexation. (*b*) The provision of an apparatus for the projection of steam in each important locality where there is much passing, such as railway stations, sea-ports, and relays of ports. The application of this is easily understood, and it may be put in operation with another object also in view—namely, the supplying of fire-engines. (*c*) Disinfection of contaminated means of transport.

13. The different States of the continent should have an understanding among themselves in regard to who are to be declared diseased, and to isolation and disinfection, and they should revise their agreements as often as the progress of science and art should require it. For the present period the agreement of the Sanitary Conference in Rome, in 1885, may serve as a model.

14. For an entire continent, a central bureau should be inaugurated, which should insure in each prophylactic security. This central bureau, international sanitary bureau, ought not to be occupied with scientific questions, and ought not to possess any executive authority, but ought to preserve the character and perform the functions of a centre of co-operation. Its duties should be the following :

(*a*) This bureau should receive from or send to the central bureau of each country official communications on the state of epidemic diseases.

(*b*) A summary of the advices of each country should be communicated to all the other bureaus, to insure promptness of execution of the prophylactic measures judged opportune.

(*c*) In like manner the sanitary bureau should act as an international exchange of observations and propositions touching the health service of epidemics, with a view to their uniform application.

(*d*) It should collect the laws and regulations for the police of epidemics, and the facts that are useful to give a clear view of the sanitary condition of the country, and watch for whatever should be announced to all the adherents.

(*e*) It should bring together the statistics of the number of sick and the number of deaths of all epidemic diseases that occur.

(*f*) It should supervise the uniformity of nomenclature of diseases and the utilization of the different statistics.

15. This international sanitary bureau should have its seat in a small State, where the possibility of political pressure is as far as possible excluded, preferably Belgium or Switzerland. It is only when the march of time shall have clearly revealed the innumerable catastrophies due to negligence, as well as the causes which have engendered them, that the different States will resolve to insure an international sanitary service by the aid of a penal code like that published in England in 1883.

At present it is impossible to bring this question to a settlement. The only thing possible is the collection and communication of facts.—*Le Progrès Medical.*

SANITARY CRANKS AND HUMBUGS.

WE had just been reading the views of an eminent sanitary expert upon impregnation of brown-stone houses with the germs of diphtheria, and had congratulated ourselves upon

having selected a modest brick front, when we were horrified to see in one of our latest architectural exchanges that an eminent sanitary expert gives it as his opinion that no brick house can be free from diphtheria, as every brick absorbs and holds from one pint to a quart of water, and is always damp. Not having made a payment on our contemplated purchase, we were once more in luck—saved by a sanitary expert, as it were—and resolved to be very cautious before vacating the little frame shanty we now occupy. Our better half, however, is determined on a move, and may possibly have her eye on a white marble palace or some iron structure, for she succeeded in finding no less than three published opinions of sanitary experts that "a wooden house is positively unfit to live in." One eminent sanitary expert gives it as his opinion that at the expiration of five years every bit of woodwork of a house is alive with all sorts of scientific things. In the latest number of an architectural paper the great Wingate tells us that even "the vicinity of large quantities of wood is dangerous to health," and talks above zymotic germs and the mycelin of the fungi in a way that is suggestive of bacteria and microbes. We will mention, incidentally, that the house is for sale, and that we purpose tenting out for the rest of the season. Nevertheless, we do not believe in these creeping things. These fellows who see snakes are generally cranks, and it is more than likely that the fellow with an antipathy to bricks had one in his hat, and the block-headed fellow had "a stick in his'n," as a chap can get tight now and "see things" on just that kind of timber. An eminent German sanitary expert says that chemists have succeeded in making a first-rate brandy out of sawdust. A man can, therefore, get a rip-saw and go out and get as drunk as a lord on a fence-rail. What is the use of a prohibitory liquor law if a man can make brandy smashes out of the shingles of his roof, or if he can get delirium tremens by drinking the legs of his kitchen chairs? You may shut an inebriate out of a gin-shop and keep him away from a tavern, but if he can become uproarious on boiled sawdust and desiccated window-sills any attempt at reform must necessarily be a failure, and we think that the opinion of a sanitary crank upon the jim-jams of a house should be taken with a liberal grain of allowance.

We have been very much interested in this question of sanitary engineers, and as we see a prize conundrum in one of our exchanges, asking "What is a Sanitary Engineer?" we will give the answer which accompanies the question as follows: "Most persons have such a vague notion as to what are the functions of a sanitary engineer that it may be pertinent to offer some brief explanation, especially at this time when householders' thoughts are turned in the direction of setting their homes in order for the winter. A sanitary engineer undertakes to advise owners and occupants of all sorts of buildings about their healthfulness. He points out defects in the plumbing, drainage, and ventilation, and the best and most economical methods of curing them. He is a house physician who tells what things threaten the health of the inmates, and how to escape calling in the regular physician. He preaches the gospel of cleanliness, and teaches the incalculable value of the ounce of prevention. Hundreds of individuals in all parts of the country have appreciated the value of this service, and it only needs that its nature should be better understood for every intelligent man to follow their example."

We will not split hairs about the above interpretation, for it is well known that the term sanitary signifies "tending to promote health," and an engineer is "one who is skilled in mechanics." But there is room for a wide difference of opinion as to whether there is any such profession or degree. If there is, who confers it? What are the requisite qualifications and before whom should the applicant be examined before receiving his diploma? To be a plumber one must serve a five years' apprenticeship, followed by years of arduous practical experience. Has a royal road to this particular knowledge been discovered? Can any one be recognized as a mechanical expert in this hard, practical business, who knows less about the actual requirements than a green apprentice? Jaw and cheek may take the place of skill and experience, and glib words and a smattering of unintelligible jargon may do to frighten nervous women into engaging the services of a charlatan, but when they attempt to attack reputable plumbers and criticise work which they do not understand, it is time that such cranks and humbugs were sat down upon. There

may be some honorable men, so straightened in financial circumstances as to call themselves sanitary engineers and to be compelled to earn a living by tracing out imaginary smells; but if such there are, we have never met them, and it has been our unfortunate experience, as yet, to meet only those who had the conscience of the bunco steerer and the aims of the confidence skin.—*The Sanitary Plumber.*

CONTEMPT OF COURT.—Of all the curious reading that we have enjoyed in some time, we think that afforded by a communication from Dr. F. E. Stewart to the current number of the *Druggists' Circular* certainly caps the climax. It affords a splendid illustration of the wisdom of the adage which advises the shoemaker to stick to his last. Whenever a physician strays from his own profession into the intricacies of the law, and especially of the patent laws of this country, his feet are in dangerous and slippery ground, no matter where his head or heart may be. In the present paper, Dr. Stewart attacks the recent decision of the United States District Court in the matter of the suit of Battle & Co. against the Grosses (Daniel W. and Edward Z.) for infringement of their copyright of Bromidia. He declares that the decision is not final or binding, and advises the Grosses and druggists generally not to pay any attention to it. Dr. Stewart thus puts himself in contempt of the United States Courts and advises others to place themselves in the same foolish and dangerous predicament. The queer part of the matter, however, is that every reason which he advances against the validity and justice of the decision is the strongest possible argument in its favor, and the reader must be obtuse indeed not to see that it is so. This view of it was evidently taken by the editor of the *Circular*, who says: "While giving Dr. Stewart's argument publicity on account of its novelty, we think it proper to remind pharmacists that they are bound by the decision so long as it is allowed to stand"—which advice is good, sound sense, like pretty much everything that emanates from the editor of the journal quoted.—*St. Louis Medical and Surgical Journal, January,* 1888.

HYGIENIC THERAPEUTICS—A LECTURE ON KINESITHERAPY.

By Professor Dujardin-Beaumetz, Paris, France.*

Gentlemen: Last year, in a series of lectures, I undertook the study of alimentary hygiene; this season I intend to complete the subject of hygienic therapeutics by considering the benefits derivable from movements and exercise, air, water, and climate in the treatment of diseases. In the present series, then, I shall successively treat of kinesitherapy, massage, hydrotherapy, ærotherapy, and climatotherapy. I hope to show you that these hygienic agents, as well as alimentation, have an important and often preponderant *rôle* in the treatment of a great number of affections; I hope also that you will receive with the same interest and the same indulgence this second part of my course on hygienic therapeutics.

I shall begin by the study of exercise and of movement as applied to the treatment of diseases. To the sum of these curative means has been given the name of *kinesitherapy* (from *χίνησις*, movement, and *θεραπεία*, treatment). I shall devote this first lecture to the history of gymnastic therapeutics, and the physiological phenomena developed by movement; then, in the next lecture, we shall complete the subject by the examination of the methods and modes of application of kinesitherapy.

I do not intend to go over the entire history of gymnastics; you will find in the Report of Hillairet, in Collineau's "Gymnastics," and in the treatise of Dr. Chancerel on "Medical Gymnastics," published in 1864, all the more important data connected with kinesitherapy.† But it is especially in that

* Delivered in Cochin Hospital, and printed from advance sheets.

† Dally père, "Cinésiologie ou science du mouvement dans ses rapports avec l'éducation, l'hygiène et la thérapeutique," Paris, 1857; Dally fils, art. "Gymnastique," in "Dictionnaire encycl.;" Hillairet, "Enseignement de la gymnastique dans l'Université, 1878;" Collineau, "la Gymnastique," Paris, 1884; Chancerel, "Histoire de la gymnastique médicale depuis son origine jusqu'à nos jours" (Thèse de Paris, 1864).

remarkable work of Dally, Sr., entitled "Cinésiologie," from which all subsequent writers in this department of therapeutics have drawn so largely, that you will see an exhaustive handling of this whole subject. Finally, in the article of Dally, Jr., in the "Dictionnaire Encyclopédique," you will find much valuable information on this matter, and this especially from a physiological point of view. I shall, then, content myself with giving you a brief summary of the leading facts in the history of medical gymnastics, being persuaded that such an abridged statement will not be devoid of interest and profit.

Prehistoric man, as I told you in my last year's course, can hardly be said to have employed, in the treatment of diseases, any agents except such as are derived from hygiene, and among these must be included movement and exercise. Obliged to contend against the inclemency of the seasons, and against animals physically better endowed than himself in the struggle for existence, primitive man was obliged for his own support and defence to devote himself to a kind of natural gymnastics, which gave him extraordinary strength and agility. There is evidence, also, that he was fond of those dances which are now so common among all savage tribes, as the Australian, the Neo-Caledonian, the Tasmanian; dances inspired, according to Letourneau, by the chase or war. In their hunting dances, these primitive men imitate the actions of the animal which they are wont to pursue, and all the exciting details of the chase; it is a dance of joy and hilarity. As for the war-dance, all savage tribes are wont to prepare themselves for the battle by a pantomimic rehearsal of the fight, and there are innumerable forms of the martial dance, from the cannibal war-dance of the Neo-Caledonian to the Pyrrhic of the Greeks.

These war-dances are interspersed with chants, and one of the most curious is that which De Rochas has put in the mouth of the Neo-Caledonians: "Shall we fight the enemy? Yes. Are they strong? No. Are they valiant? No. Shall we eat them? Yes."

But at the very dawn of human history, it is among the inhabitants of China and the Indias that we find the first indications of the co-ordination of elements derived from exercise and movement for a determined hygienic purpose. Nearly

three thousand years before the Christian era, under the reign of the Emperor Hoang-Ti, appeared a treatise entitled "Cong-fou, or the Art of Man," where were set forth at length all the principles of gymnastics, and even the application of the latter to the treatment of disease. The precepts therein inculcated are in accordance with the Chinese maxim: "Perfect thyself; renew daily thy substance; renew perpetually thy vigor."

The "Cong-fou" insists at great length on the necessity of respiratory gymnastics, and endeavors to explain this necessity from physiological reasons. According to this Chinese book, it is exercise which establishes the equilibrium of respiration, and respiration keeps up the proper adjustment in the movements and composition of the blood. "Respiration," adds this ancient hygienic writer, "changes the composition and proportion of the principles of the blood." It is worthy of remark that these statements are in harmony with modern science.

I shall not here reproduce all the details which this book gives relative to movements to be practised. It prescribes three attitudes or postures, and these admit a great number of varieties. Three ways of breathing are indicated—one by the mouth, another by the nose, the third by the mouth for inspiration and by the nose for expiration. These forced breathing exercises are as much in use to-day as they were forty-five hundred years ago when first prescribed.

We who belong to the Indo-European family are especially interested in knowing what the Hindoo race knew relative to the gymnastic art and its applications. When the white men, the *Pandous*, sixteen centuries before the Christian era, had driven out the black men, the original occupiers of the soil (the *Kourous*), the Vedas appeared—the sacred books of the nation, supposed to have been a revelation from Brahma. Among these Vedas there is a book called the "Ayur-Veda, or Science of Life," which is devoted to medicine.

According to the mythical tradition, an ancient sage, Bahradwaja, to remedy the ills and infirmities which afflicted humanity, demanded help of Indra, who kindly granted the prayers of the sage and taught him the precepts of the "Ayur-Veda."

This "Ayur-Veda," the most ancient book of Hindoo medicine, is divided into eight chapters, one of which is devoted to alimentation and to hygiene. These precepts of the "Ayur-Veda" have been reproduced in the work of Susruta, where they may now be seen. You will find also in the "Code of Manou," compiled about 1300 B.C., much valuable information respecting the hygiene of the Hindoo nation. You will there observe, as in the "Cong-fou," precepts concerning frictions, massage, ablutions, and rules for breathing.

The sixth book of the "Laws of Manou" says in express terms, "The Sanniasi (devotee), to purify himself, must bathe and hold his breath six times; he effaces his sins by holding his breath." By the side of these religious rules we must also place the dances which were practised at the doors of the temples, and which you will find described in the recent work of Dr. Edmond Dupouy. These dances, performed by Indian priestesses (bayadères), made part of that assemblage of practices to which has been given the name of sacred prostitution.*

From India the practice of gymnastics was carried over to Egypt, and there maintained its sacred and military character. Writers have especially insisted upon the military character of gymnastics, and under the name of *Agonistics* were included a variety of martial feats and dances. The study of the monuments of Egyptian antiquity leaves no doubt as to the development and importance which these dances and these exercises had acquired in the social education of the Egyptians. You will find in the works of Champollion-Figeac, and especially in the treatise which Krause has devoted to this subject, much valuable information respecting these exercises.

We come now to Greece in the day of its glory, and we may also say, to the time of the highest development of gymnastics as applied to the perfecting of the body and to the treatment of divers diseases. Admirers of physical beauty, of which the ancient statuary has given us immortal examples, the Greeks carried, as far as possible, the application of exercise and of movement to the vigorous and well-proportioned development of the body, and in the education of their youths and in the training of adult life, the efforts of this ancient

* Dupouy, "La prostitution dans l'antiquité."

people had this one end in view, "To put the soul of a sage into the body of an athlete."

The Olympian and Isthmian games, by the almost divine honors bestowed on the conqueror, show us the importance which all Greece assigned to gymnastics. St. John Chrysostom tells us, in fact, that when the athlete Exanetus returned victorious from the Olympian games, his fellow-citizens made a breach in the walls of his native city to give entrance to the three hundred white horses and their chariots which formed the triumphal procession.

We have quite exact data respecting the Grecian gymnastics, and you will permit me to state rapidly the principal facts. The Greeks divided gymnastic exercises into four classes. There were first the natural exercises, racing, leaping, swimming, walking, wrestling; these were called *palestrics*, from παλαίω, to wrestle. Then came movements with military arms; this kind of gymnastics was called *oplomachia;* religious dances constituted *orchestrics;* lastly came *medical gymnastics*, which formed an important branch of the art of healing.

The gymnasia where the Greek youths exercised themselves, and where also philosophers gave instruction, were immense and magnificent buildings, where were accumulated the most beautiful specimens of ancient statuary and Attic marble. Athens had four of these great gymnasia—the Academy, the Lyceum, the Ptolemion, and the Cynosarge, the latter being reserved for the lower classes and for slaves.

There, under the direction of the *gymnasiarchs*, the young men of Greece engaged with enthusiasm in all sorts of physical exercises. Men and women practised gymnastic exercises completely naked, for the Greeks associated the idea of exercise with that of nudity, as the name *gymnastics* (from γύμνός, nude) implies. Without doubt, it is to the practice of these exercises, and this habit of performing them naked, that the Greek sculptors were able to find in the gymnasia models of all that we to-day consider as the idea of physical beauty.

Herodicus, one of the teachers of Hippocrates, was the founder of medical gymnastics. Having experienced in his own person the good effects of exercise, in being thereby cured of a disease regarded as incurable, he recommended it

for a great variety of affections, and carried to the extreme the precepts of gymnastics. Thus, to fever patients he ordered a walk from Athens to Eleusis by way of Megaris, and back again without stopping, which represents a distance of thirty-three kilometres, or about eighteen miles, one way; this would make altogether a pretty long walk of sixty-six kilometres for a patient in a febrile condition. Hence it is that his pupil Hippocrates blames Herodicus, and affirms that often persons succumbed to the effects of these forced exercises.

After Herodicus, next in order comes Iccus. While the former was pursuing his vocation at Athens, Iccus was filling the office of medical gymnasiarch at Tarentum. He was the first to conjoin with the exercises to which the athletes were subjected, a special dietary regimen, thus laying the foundations of physiological training.

Disciplined or trained for an exclusive end, veritable products of the gymnasium, the athletic champions of the Olympian or Isthmian games presented but a moderate resistance to the fatigues of hard labor, and especially to those of war, and made but middling soldiers. Hence it is that Hippocrates, who has so well summarized the precepts pertaining to the application of movement and of exercise to the treatment of diseases, protests strongly against the abuses of gymnastics, and his view is summed up in the following aphorism: "It is from the exact proportion between exercise and health that the harmony of the functions arises."

Greek medicine made every way great account of movements and of exercise in the treatment of diseases. Hence Littré, with good reason, considers medical gymnastics as one of the three sources of Greek medicine, the other two being furnished, the one by the precepts of the priests of Æsculapius, the Asclepiades, the other by the teaching of the philosophers, who, as you know, gave the study of medicine a place among the branches of knowledge which they imparted. For a time the Asclepiades had few followers, and almost everybody frequented the gymnasiums, where were found together the gymnasiarchs and the philosophers.

You will find in one of the writings of Hippocrates a passage which well expresses the notion which was held respect-

ing the action of gymnastics in the treatment of diseases: "The fullers trample their fabrics under their feet, they wring them, they beat them, they wash and scrub them, and toughen them, removing all their impurities, and it is the same with regard to our bodies, and this is the good which we get from the practice of gymnastics."

In passing from the Greeks to the Romans, gymnastic exercises underwent a transformation. It was no longer the supreme end to attain the ideal of physical beauty, but the predominant desire was, on the one hand, to make soldiers; on the other, gladiators. In annexing baths to the gymnasia, an innovation borrowed from the East, the Romans completely modified these establishments, which little by little became places of debauchery, and they thus prepared the people for the ages of decadence and degeneration which followed; and all this notwithstanding the efforts of Antonius Musa, physician to Augustus and of Charmis of Marseille, who founded hydrotherapy, and substituted for vapor-baths and warm baths the usage of cold water. All the physicians of the Roman period (physicians of Greek origin be it understood) taught the utility of exercise in the treatment of diseases, and you will find in the celebrated collection which Oribasius made in A.D. 360 (under the orders of Julian) of all the writers of antiquity who treated of medicine, an entire book devoted to gymnastics; this work has been translated by Daremberg. You will there see the principal indications formulated by the ancients for the application of gymnastics to the treatment of diseases. There are, moreover, some very interesting paragraphs on respiratory gymnastics.

According to a passage of Antyllus, cited by Oribasius, the act of declaiming with a loud voice has for effect to dilate the thorax and augment the respiratory capacity, but such declamation should be prohibited in cases of hæmoptysis.

According to Galen, also cited by Oribasius, exercise is *all movement whose effect is to change the respiration.* The physician of Pergamus also dwells on the importance of all gymnastic exercises, and, furthermore, of frictions, massage, and even of passive movements, which, in his practice, constituted a veritable Swedish movement cure which was applied to the treatment of fevers.

Leaving the fourth century, we find no writers worthy of note till we come to Aetius in the sixth century, Alexander of Tralles and Paul of Ægina in the seventh century, who reproduce in their compilations almost the entire work of Oribasius. Then thick night fell on all that pertained to the arts and sciences, a night which lasted till Europe, emerging from out the Middle Ages, saw ushered in the dawn of a new period—the RENAISSANCE.

During this long period, constituting the Dark Ages, which extends from the sixth to the sixteenth century, comprehending a thousand years, the practice of hygienic exercises was not abandoned, and we see it put in use in the training of knights-errant, and while one set of men shut themselves up in cloisters, and there submitted to the rigorous rules of asceticism which were enforced in these places, others, on the other hand, gave themselves up with ardor to physical exercises, and constituted that chivalry which, if it did not create artists and men of science, nevertheless gave the world strong and vigorous men, capable of bearing the heavy accoutrements of war, and an amount of massive and weighty armor such as fills us with astonishment at the present day.

The Arabian school, which alone preserved during this long space of time the traditions of antiquity, added nothing to the practice of the ancients, manifesting rather degeneration than progress, and in the works of Rhazes you will find but a few short passages pertaining to medical gymnastics.

Coming down to the sixteenth century and the Renaissance, we find awakened a zeal for revising and collating the masterpieces of antiquity, of which collections from all sources were made. In this work of research and annotation, due place was given to gymnastics. Thus, Antonio Gazzi, of Padua, in his "Florida Corona" (Floral Crown), which is, he says, "composed of the most beautiful flowers gathered in the fields of Hippocrates and Galen," has not omitted to compile all that has a bearing on hygiene, and in particular, on gymnastics. Lastly, in 1573, at the end of the sixteenth century, appeared the first special treatise on gymnastics, the production of Mercurialis, who was, as Hillairet has well said, the father of modern gymnastics.

But it is not so much in the works of medicine properly so called, or of hygiene, that you will observe precise indications

respecting gymnastics. You will find the importance of bodily exercises recognized, and valuable lessons thereon, in the writings of the philosophers, and especially of the great reformers, who endeavored to introduce sage innovations into the education of the youth, and among these I may mention Rabelais, Martin Luther, and Montaigne.

In his immortal work, Rabelais dwells much on the necessity of gymnastic exercises in the education of his *protégé*, the young Gargantua, and we there find the precepts of the ancients accommodated to the tastes of the period. He insists particularly on the utility of respiratory gymnastics, which he says develop and strengthen the organs and muscles of the thorax.

Luther, the father of the Protestant Reformation, is quite as affirmative on the subject of the necessity of gymnastics for the preservation of the health. Gymnastic exercises, he says, give strong and robust limbs, and promote the health of the whole body. Youths who are interested in them will not be likely to abandon themselves to lazy habits, to debauchery, to strong drink, or to card-playing. Our great philosopher Montaigne has a striking passage in his letter to Diana of Frix, Countess of Gurson, in which he sets forth in a clear manner the importance of making the physical training keep pace with the moral; and I cannot but think, with Dally, that it would be well if the entire passage were printed in large letters on the walls of our schools: "It is not a soul, it is not a body, that you are developing, it is a man—and you are not to treat them as if they were separate, or cultivate the powers of the one without at the same time cultivating those of the other. They should, in fact, be managed like a pair of horses harnessed together."

Such were the views of the reformers of that time, but these precepts bore no fruit in the way of gymnastic institutions, despite the earnest pleading in behalf of a better system of physical training, at a later day, by Rousseau, who, in his "Emile," again urges the necessity of bodily exercises, and compares gymnastics to dancing, then much in vogue, and to the disadvantage of the latter, which he affected to despise.*

* He says, in plain words, that he would rather skip like a roebuck than dance like some of the performers of the period: "J'en ferai l'émule d'un chevreuil plutôt que d'un danseur de l'Opera."

I must not omit in this connection to mention the names of Nicolas Audry and Tissot. The phlegmatic dean of the Faculty, sworn adversary of the surgeons, whose thesis bore the strange title: "On the Influence which the Cheerful Demeanor of the Physician and the Obedience of the Patient may have on the Cure of Diseases"—Nicolas Audry, published in 1741 a treatise in two volumes on "Orthopædics," in which he rightly insists on the importance of movements and of exercise in the treatment of the deformities of early life. Tissot, who was surgeon-general of the light cavalry, published in 1780 a very complete work on gymnastics, which has more or less influenced all subsequent writers on the subject.

Lastly, at the end of the eighteenth century, and coincidently with the appearance of the works above mentioned, gymnastic exercises acquired a permanent place in all public systems of education, and this salutary innovation was due to one who may be regarded as the true founder of modern primary instruction as instituted on a common-sense basis; I refer to Pestalozzi. In this connection I need but refer to one simple, unpretending treatise of this remarkable man, with this *naïve* title, "How Gertrude taught her Children"—a book which lays down in a masterly manner the principles of the inductive system of education. Pestalozzi was a Swiss, of the canton of Unterwald, and no place could have been better chosen to serve as the cradle of modern gymnastics. Placed in the centre of Europe, inhabited by a population of mountaineers skilled in exercises of the body, Switzerland adopted with ardor the ideas of Pestalozzi, and there sprang up under the impulse emanating from him, gymnasiums at Stanz, at Berthoud, and at Yverdon, where flocked not only the Swiss youths, but also people from neighboring countries. Gulsmuths, a native of Saxony, became the pupil of Pestalozzi, and carried his method to Germany, while Natchtigall did the same for Denmark, so that at the commencement of this century three European countries possessed gymnasia—Switzerland, Germany, and Denmark.

From this time onward, gymnastics became a regular part of scholastic and medical training, and were cultivated in all parts of the world. There are four names in particular which sum up the efforts made in this direction during the first part

of the nineteenth century—Ling, of Sweden; Jahn, of Germany; Clias and Amoros, of France.

Ling, while a student of the University of Upsall, was suffering from retraction of the muscles of one of his arms, which resulted from a wound which he had received in 1801 in a naval battle between the English and Danes. He combated this retraction by fencing, and delighted with the remarkable results which he had obtained, he abandoned his chair of Scandinavian poetry and mythology, to devote himself specially to the teaching of gymnastics. He originated that aggregate of special exercises to which has been given the name of Swedish gymnastics, and which I shall describe at length in the next lecture, when I come to treat of the exercises of gymnastics.

If with Ling, gymnastics became identified with medicine, and to such an extent that he may be regarded as the founder of modern kinesitherapy, with Jahn it took another turn, and became associated with patriotism and military prestige. Jahn desired that gymnastics should help on the triumph of the German ideal, and took for his device: "Liberty, autonomy, our country's glory!"

As for France, it is to Clias and Amoros that we owe the establishment of the first gymnasia. Clias was born in Berne in 1780. He became professor at the academy of this city, then came to France, passed over into England, where he sojourned awhile, then came back to France again, carrying everywhere his precepts of gymnastics. It is especially in a report to the Society of Medicine of Paris that you will find the clearest indications as to what his teaching of gymnastics consisted in.

Amoros was a Spaniard, who, for political reasons, was exiled from his native country. He made France his home, and devoted his life to the propagation of gymnastics. I myself when a boy attended the exercises of Colonel Amoros. These exercises took place in an immense gymnasium, which he had built in the Champs Elysées, in the street which now bears the name of Jean Gougon. Thither Tuesdays and Sundays the pupils of the different boarding-schools were conducted, and when the exercises by section were finished, we were all marshalled together into an apartment, where Colonel

Amoros taught us to perform, while singing, those exercises in concert which constituted more particularly the gymnastic system of Amoros.

From the time of Clias and Amoros, gymnastics underwent rapid development in France, and became obligatory in the primary schools, while in the army the soldiers were taught to execute those concert movements, and those movements tending to give suppleness to the limbs, which so fit them for their special calling.

Among the numerous masters of gymnastics, there is one whom I ought to signalize, especially since all mention of his name is omitted in the otherwise very complete thesis of Chancerel; I allude to Napoleon Laisné. He was the first to teach gymnastics in the hospitals of children, and under the direction of Blache and of Bouvier, he applied gymnastic exercises in our hospitals to the treatment of convulsive disorders, such as chorea; and to-day, despite his great age, Laisné has not ceased personally to teach and to direct the teaching of gymnastics in our hospitals and schools.

Before setting forth the various methods and their application to therapeutics, I desire to devote the rest of this lecture to a rapid survey of the physiological action of gymnastic exercises. It is on these effects that we base the applications of medical gymnastics.

Gymnastics act first on the circulation and respiration. The effect on the respiration is, perhaps, far the most important, and Dally has emphasized this point; and in this connection I need only recall to your minds the importance which the ancients attached to the influence of exercise on respiration.

In a general way, gymnastic exercises augment considerably the chest capacity. You can judge of the increase of the amplitude of the chest by the use of registering apparatus to measure the respiratory movements.

In a work written conjointly by Chassagne and Dally * at the Military School of Gymnastics of Joinville-le-Pont, these authorities have shown that of four hundred and one individuals subjected to gymnastic exercises for five months, in three hundred and seven (or seventy-six per cent), the bi-

* Chassagne and Dally, "Influence of Gymnastics on the Development of Man," 1881.

mammary circumference of the thorax had increased by an average of two and one half centimetres. In Germany, Dr. Abel obtained similar results, seventy-five per cent of individuals practising gymnastics having experienced an augmentation of the thorax.

Another mode of mensuration consists in applying to the thorax the process employed in craniometry; this is Fourmantin's method. Under the name of *thoracic index*, he gives the centesimal relation of the transverse diameter of the thorax to its antero-posterior diameter, a relation expressed in the following formula: $\frac{DT}{100} \times DAP.$

The flatter the chest, the higher will be the index figure, and the rounder the chest, the less will be the figure, for flattening of the chest corresponds to low development and low respiratory capacity. In phthisical patients, for instance, the thoracic index varies between 135 and 152, while in individuals possessing a sufficient and normal respiratory capacity this index is but 128. Gymnastic exercises tend to lower the thoracic index.

But the instrument which most clearly expresses the amplitude of the respiratory movements is the pneumograph, which enables us, as you may now see, perfectly to enregister the amount of respiratory expansion.

In the interesting researches made by Marey* "On the Influence of Movement on the Respiration and Circulation," he obtained, by the aid of the pneumograph, tracings which I here place before you, and which show you, better than anything else can do, that under the influence of gymnastic exercises the amplitude of the thoracic movements may be doubled.

This augmentation in the capacity of the thorax has several consequences. First of all, it enables a greater quantity of blood to come in contact with the air of respiration, and this increases the combustions of the economy. It also enables a greater quantity of air to penetrate the lungs. This latter is of capital importance, for this augmentation of the respiratory capacity opposes that breathlessness (*i.e.*, that marked increase of respiratory movements) characteristic of active exercise.

* Marey, *Acad. des Sciences*, July 10th, 1881.

Edward Smith has, in fact, shown us, that if we represent by the figure 1 the quantity of air which hourly penetrates the lungs (five hundred and forty litres) in an individual lying down, this figure will augment in the following proportions, if the individual devotes himself to the exercises below specified :

Standing	1.33
Moderate walking	1.90
Rapid walking	4.76
Horseback-riding	2.20
" galloping	3.16
" trotting	4.05
Swimming	4.31
Rapid running	7.00

In order to cause a sufficiently large quantity of air to penetrate the lungs during the corporeal exercises which I have just enumerated, such an augmentation of the ordinary movements is required, that breathlessness is rapidly produced in persons who are not habituated to these gymnastic exercises. But, as I have just told you, gymnastics, by augmenting the respiratory capacity, enable the individual to breathe in more air with each respiration, and thus lessen the number of respirations and avoid getting out of breath.

In the tracings which I have just shown you, you saw that the pulse was also indicated, and that exercise augments both the number of the pulsations and their amplitude. This influence of gymnastics on the circulation is quite as important as their influence on the respiration. The greater activity of the circulation results from two causes—first, the muscular contraction ; second, the increase of pulmonary capacity.

Muscular contraction energizes the venous circulation. We have a proof of this in the operation of blood-letting, when, in order to obtain a freer flow of blood from the open vein, we tell the patient to execute with the hand movements which bring into play the muscles of the forearm. The enhanced activity of the pulsations of the heart is also due to the fact that the pulmonary capacity being augmented, the demand for venous blood by the lungs is greater. More blood comes to the right ventricle, which causes more to flow into the left

ventricle, so that the venous circulation and the arterial circulation are augmented. As to the action on the heart-muscle, I shall take that up in the next lecture, when I come to the treatment of diseases of the heart by gymnastics.

In the muscles the influence is more direct. Forcible contractions give rise, in the muscular substance, to physical and chemical phenomena which augment the nutritive exchanges, and cause the muscular bundles to become thicker and firmer. I have no need to give you in this place direct proofs of this fact. Such physiological proofs abound, and you have only to confine one limb in splints and exercise the other, to have a demonstration of the atrophy which attends the bandaged limb, and the increased development which marks the limb that is exercised.

These exercises not only promote the development of the muscles, they act also favorably on the nervous system. In fact, every co-ordinated muscular movement entails a nervous expenditure, and without going as far as DuBois-Reymond (*Revue Scientifique*, 1880), who affirms that the exercises of the body are rather exercises of the central nervous system, than muscular exercises, one may truly say that gymnastics tend to restore the equilibrium between the functions of the brain and those of the spinal cord.

Gymnastics act not only on the respiration, circulation, musculation, and innervation, they also promote secretion and excretion.

All movements which are somewhat prolonged provoke the production of sweat, which is one channel of elimination for urea and uric acid. I have seen the perspiratory secretion augment by an hour's exercise to six hundred grams, and even in some subjects attain the figure of fifteen hundred grams. This is, you know, a channel of excretion which is vicarious with the renal emunctory, and which we may utilize to great advantage in therapeutics.

If I were to sum up in one sentence the physiological action of gymnastics and bodily exercise, I would say that they promote and invigorate nutrition. I have just showed you that by the enhanced energy of the circulation, and the increase of the respiratory capacity, a greater quantity of venous blood comes in contact with the air, and that this energizes the

phenomena of combustion. I have shown you, moreover, that by exercise the muscular interchanges are promoted.

This augmentation in the muscular and respiratory combustions entails an augmentation of heat, and in this connection we may properly refer to the careful experiments of Rouhet and of François Franck.* These experimenters have demonstrated that muscular exercises augment the central temperature, but that, owing, on the one hand, to the production of sweating, and, on the other, to the greater quantity of venous blood brought in contact with the air of respiration, and producing a veritable pulmonary sudation, equilibrium is established between the external temperature, which falls, and the temperature of the deep parts, which rises.

But this is but one aspect of the question. Last year I showed you the important *rôle* of the cell in nutrition. Under the influence of gymnastics, the activity of the cellular functions is enhanced and regulated, the intra-cellular combustions are energized, the leucomanes, those toxic alkaloids which the organic cell constantly fabricates, augment in quantity, and are more actively eliminated; and from all these circumstances it results that fatty substances and waste extractives are burned, cell repair is promoted, and equilibrium is effected between the cells of the brain and spinal cord; in a word, general nutrition is expedited.

The digestive functions do not remain indifferent to this nutritive gain, and they are beneficially influenced in two ways—first, by the contractions of the diaphragm and abdominal muscles, which invigorate the abdominal and hepatic circulation, and indirectly by the augmentation of the combustions of the economy; and it is a trite thing to say that exercise increases the appetite. Hence Chomel was right in affirming that one digests with his legs as well as with his stomach.

It must be borne in mind that to obtain this enhanced activity of digestion, it will not do to undertake violent exercise immediately after the ingestion of a hearty meal. You all remember the fact, so frequently mentioned in treatises on physiology, that when you take two dogs after a full meal,

* Rouhet, "Experimental Researches on the Physiological Effects of Gymnastics and of Training," pp. 36 and 45. Paris, 1881.

and shut up one of them in its kennel, and cause the other to engage in violent running, digestion is more advanced (other things being equal) in the dog which is kept at rest than in the one which is subjected to active exercise.

This general influence on nutrition is represented by palpable signs, and this is the case even in adult men—augmentation of muscular force and augmentation of weight. In a table which you will find in the work of Chassagne and Dally, and which I here place before you, you see indicated the augmentation in kilogrammes noticed in the pupils of the Military School of Joinville le Pont :

	Augmentation in kilogrammes.	Percentage of pupils.
Lifting force	28.00	86
Force of flexion of the forearm on the arm	3.14	63
Force of flexion of the fingers on the palm of the hand	9.75	81
Force of the extended arm	2.41	74
Force in carrying loads	11.52	66
Force of progression or of traction	9.81	65
Force of the triceps contraction, or of ankle contraction	10.08	75

As to the augmentation of weight, it is far from being constant under the influence of gymnastic exercises. Hence among these same pupils, trained in gymnastics, thirty-four per cent only, at the end of six months of training, had increased in weight by an average of 1.14 kilogrammes ; the remaining sixty-six per cent had either not gained at all, or had lost in weight, and this is easily explained. Gymnastic exercise, by favoring the combustion of fats, and by augmenting the organic combustions generally, by invigorating the cellular nutrition, is a powerful means for promoting emaciation, of which we avail ourselves in the treatment of obesity. Hence it is that gymnastics have the effect to make corpulent persons grow lean, and to lose in weight, while both muscular development and muscular force are augmented.

In individuals who have no accumulation of fat in the cellu-

lar tissue, corporeal exercises, on the contrary, will have the effect by augmenting these muscles to increase their weight. But to obtain these effects it will not do to carry the exercise too far, for, if practised to excess, the individual will grow lean and become feeble, and offer all the symptoms included under the name of *overstrain* (*surmenage*).

The effects of overwork have been well studied in animals, and, in particular, in horses. When you subject animals to excessive toil, you see them grow lean and feeble, despite abundant feeding, and they easily become a prey to epizootic diseases. It is the same with man, for gymnastic exercises, carried to too great a length, weaken and prostrate, and render the person an easy victim to tuberculosis.

What I say, gentlemen, has been known from remote antiquity, and the Father of medicine, while recognizing the utility of physical exercises, protests against their excess. He shows that athletes in particular stand the fatigues of war with difficulty, and fall a prey more readily than others to diseases; in a word, they make poor soldiers.

But if for the adult age gymnastics when pressed too far are hurtful, for children a reasonable amount of such exercises is in every way advantageous. In the early period of life the child is in the plastic, formative stage of its existence, and its constitution readily takes the bent which its physical education imparts. In giving the child a judicious gymnastic training you develop the skeleton and the muscular tissue, you augment the capacity of the thorax, you invigorate the circulation, you equilibrate the functions of the nervous system, you favor nutrition; in a word, you develop all that pertains to robust manhood.

Therefore there is general agreement in giving gymnastics an increasingly prominent place in the education of boys and girls. But this is a point to which our civilization has long been tending, and I have already said sufficient about its importance. I pass on now to a consideration of the applications of gymnastics to the treatment of diseases, a subject which I shall take up in the next lecture.—*Therapeutic Gazette.*

MORTALITY IN INDIA CAUSED BY WILD BEASTS.

WE clip from the *Saturday Review* of January 14th the following review of the Government report on "Campaigning against Snakes and Wild Beasts."

The Annual Report drawn up for the Government of India on the measures taken for the destruction of snakes and of wild beasts is an interesting illustration of the conditions of life and of the duties of Government in that peninsula. Year after year the campaign goes on against these pests. But an examination of the returns shows that the Government is hardly getting the mischief under. The last ten years nevertheless give a grand total of over two hundred thousand wild beasts and more than two million and a half snakes destroyed. It is curious to note that more than a half of the venomous reptiles extirpated are put down to the Bombay Presidency. Other indications, though this is certainly the most striking, point to the Government receiving more support in its measures from the inhabitants of Western India than elsewhere. But, in spite of this gigantic slaughter, the number of human beings actually done to death, and of cattle and domestic animals lost to the community, remains much the same. In the year 1886, for which the figures have just reached home, the number actually rose. The bill of mortality amounted to nearly 25,000 in all, or not far short of 2000 more than in the preceding year. The increase was due entirely to deaths from snake-bites, which reached the number of 22,134. It must be remembered, however, that, dangerous as the snakes are, they still probably bear somewhat more blame than they deserve. Death from snake-bite is a too obvious explanation, unfortunately, when the disgraced widow disappears in the zenana, or a child has been murdered in one of those obscure sacrifices which a frenzy of native superstition, or the desire to guard hidden treasure with the spirit of a boy still demand.

Among animals the tiger continues to hold a bad pre-eminence as the most deadly foe to human life. Not far short of a thousand people proved in their own cases that the man-eater is yet far from being extinct. But though the mortality

among human beings increased during the year under review, the loss of cattle—57,451 head—showed a diminution. Some consolation might be gathered from this if the figures were to be relied upon. But, unfortunately, these figures are extremely vague, and the Government is convinced that they do not by any means represent the real loss. The natives in up-country localities are at no great pains to report cases, and the stations where the reports can be taken are few and far between. More trustworthy evidence of the progress of the campaign against wild beasts is afforded by the returns of animals and snakes destroyed. Zeal is here stimulated by the Government rewards. For the year 1886 we observe a decline in the numbers which is by no means satisfactory. As against 1855 tigers, 5466 leopards, and 1874 bears killed in 1885, the figures were only 1464, 4051, and 1668. A decrease in the number of snakes destroyed from 420,044 to 417,596 is also reported. Various explanations are offered for this. It is stated that the rewards are too small in some provinces, or that they are unpunctually paid, as in Bengal, while the people qualified to certify for them are inconveniently few. Attention has been called by the supreme Government to the necessity of remedying this.

The utmost possible results should certainly be obtained by the Indian authorities for their campaign against snakes and wild beasts, since the operations cost Government a round sum. In 1886 the rewards paid amounted to Rs. 189,000. But during the previous decade the disbursements ran up to over a crore and a half of rupees. We note, however, with satisfaction the complaints against the Arms Act are unfounded. It is a stock theme of native agitators to contend that the act cripples the native community in their struggle with wild beasts and exposes both them and their crops to unnecessary depredations. But a scrutiny of the working of this act shows that contention is a flimsy one. Over 86,000 licenses under the act were current during the year in question, and it must be borne in mind that these licenses are granted without payment. But the destruction of less than 23,000 wild animals is disproportionate to the facilities offered, and brings out the supineness of the native population clearly enough.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.*

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

VI. *Sewerage.*

A. FRANCE.

Dr. A. A. Parmentier. "Observations sur les fosses d'aisance, et moyens de prévenir les inconvenients de leur vidange." His medal was described under Section I., and was referred to in Section IV., Mineral Springs. He will be again mentioned in Sections X., Vaccination, and XI., Military and Naval Hygiene.

B. HOLLAND.

J. H. Van Swinden. Memoir on cleaning canals and streets. His medal was also described in Section I.; he has been referred to in Sections II., Water Supply, and V., Drainage, and will again be alluded to in Sections X., Epidemics, and XIII., Registration.

There are two special medals known to me as belonging to this department.

A. FRANCE.

348. Obverse. Hygeia crowning a winged youth, who bears in left hand a partially unrolled manuscript, and in right a roll with mathematical drawing, hanging half over a shield, upon which a fleur-de-lis. Behind him Æsculapius, with staff. Legend: Salubrité. Caque F. 1820. Reverse. Inscription: Fosses Mobiles Inodores. Urate. Bronze. Octagon. 21.

This is in the Lee Collection. It is, no doubt, to be included also with the medals and tokens illustrative of agriculture and rural economy, but it distinctly belongs in this connection, and so does the following.

* Continued from Vol. XX., page 169.

B. GERMANY.

(*a*) *Dresden.*

349. Obverse. Inscription: Marke | Der | Dünger W— Anstalt | Zu Dresden. Reverse. Inscription: Gegen Ruckg. Dieser | Marke Wird Eine | Fuhre Dünger (load of manure) | Verabfolgt.

Neumann, No. 39,858.

This token was bought in quantities by farmers and exchanged for the loads as taken.

(*b*) *Braunschweig, in Brunswick.*

350. Obverse. + + Urin | Zeichen | 1697 Beneath, a head between leaves. Reverse. A broad-based barrel, between squares. Copper. 18.

Ibid., No. 32,875.

This check for the delivery of urine was not for agricultural purposes, as I had at first supposed, but for the bleaching of cloth. It is in my collection.

In an investigation like the present, care must be taken not to draw conclusions too hastily. It might be thought from the legend that the following medal fell within this classification, but it does not

Pope Clement XII. De. Luto. Faecis (From the dust of the earth). (1738.) Gold.

Minart Cat., Paris, 1880, p. 89, No. 1978.

There is a rare American token of the "Hard Times" series of 1837, which is not wholly out of place in this section.

351. Obverse. Laureated female head to left. Above, upon a band, E Pluribus Unum To left, six stars; to right, seven. Exergue: 1837. Reverse. Inscription: J. H. Dayton's Union Steam Washing Es^{t} * | 17th S^{t} Near 5th Avenue | Washing | Done For | Ships, St. Boats | Hotels & | Private Families | * N. Y. * (Neumann has Steam Boats, in full.) Edge of obverse milled; of reverse beaded. Bronze. 18.

Fonrobert (Nord-Amerika), No. 3123.

Neumann, No. 21,754.

Low, "Descriptive Cat. of H. T. tokens," 1886, p. 14, no. 61.

This is in my collection.

It is my opinion, moreover, that here belong, contrary to all previous classification, the tokens relating to cemeteries and the undertaker's trade. They have always been considered by numismatists as "medical," probably as a grave joke; but as they pertain to the removal from the dwellings of man and their vicinity, of most dangerous organic dead material, they should be considered in connection with the branch of sanitation which covers the more ordinary methods of that process.

A. A. Parmentier, of Paris, who has already been mentioned in this section, may be spoken of again for his writings upon the subject: "Recueil des pièces concernent les exhumations faites dans l'enceinte de l'église Saint-Éloi de Dunkerque."

A. United States.

(*a*) *New York.*

352. Obverse. Indian Liberty head, to left. Beneath, L. Roloff. Thirteen stars. Exergue: 1863. Reverse. A coffin within two crossed branches. Inscription: J. J. Diehl Undertaker | 133 | Essex St. | (rosette) New York (rosette). Copper. 16.

Fonrobert (Nord-Amerika), No. 3125.

Neumann, No. 39,280.

Coin Collectors' Journal, viii., p. 24, No. 50.

This is in my collection. The dies have also been used upon U. S. quarter dollars, "the inscriptions and devices being curiously commingled."

Woodward, sixty-seventh sale (Levick), May, 1854, and seventy-third, April, 1885; Low fifth sale, Feb., 1885.

Am. Journal of Num., i., p. 54.

353. Obverse. Indian head to left. Beneath, E. Sigel. Inscr.: Fr. Freise, Leichenbesorger | 12 Ave. A, | * New York. * (Neumann has Siegel.) Reverse. A coffin, within bows tied by ribbon. Inscr: Fr. Freise, | Undertaker | 12 | Ave. A. | New 1863 York Brass; copper. 16.

Fonrobert (Nord-Amerika), No. 3141.

Neumann, No. 39,285.

Am. Journal of Num., i., p. 54.

Coin Coll. Journal, viii., p. 25, no. 58.

This is in my collection. A specimen in brass, which is very rare, is in that of Harvard University.

(*b*) *Ohio.*

354. Obverse. Liberty head, to left, with thirteen stars. Exergue: 1868. (A copy of the U. S. gold double eagle.) Reverse. Inscr.: John. F. Wiltsee | Funeral | Furnisher | * | Coffins—Hearses | & Carriages | No 295 W. 6' St Cin. O Gilt shell; one of the Tilton series. 22. Edge of obverse milled.

Mercer's list, Numismatic Directory, 1884.

This is very rare. It is in my collection.

B. ENGLAND.

(*a*) *Newcastle-upon-Tyne, Northumberland.*

355. Obverse. Wood & Kimpsters Funerals Furnished (&c &c). Reverse. (W. & K.) 17, Grey Street | Newcastle.

Neumann, No. 26,574.

(*b*) *Macclesfield, Cheshire.*

356. Obverse. 1½ | W. H. Masters | Childers Inn | Burial Ticket | Macclesfield Reverse. A laurel wreath.

Ibid., No. 27,637.

(*c*) *Birmingham, Warwickshire.*

357. Obverse. View of the cemetery. Beneath, to left, Halliday. Birm. Exergue: Church of England | Cemetery | Birmingham Reverse. Inscr.: Consecrated | By | The Lord Bishop | of Worcester | August 8th 1848 | —+— | Hamilton & Medland | Architects. White metal. Edge of obverse lined; of reverse milled. 25.

This is in my collection.

358. At the sale of Dr. Mead's collection, at London, in 1755, there appeared among the medals of the reign of George II. "a Silver Burial Ticket, with the Arms and Cypher of Lowther" (the family of the Marquis of Lonsdale).

Cat. of Mead sale, p. 192.

C. HOLLAND.

(*a*) *Maestricht.*

359. Obverse. Within a circle, a death's head. Beneath, a carpenter's hatchet. Upon sides, 16–82. Reverse. Within a beaded circle, engraved, Bei Mir Hendrich | Heiss

Revue Belge de Num., iii.

Neumann, No. 35,371.

A jeton of the Undertakers' Guild.

D. GERMANY.

(*a*) *Augsburg.*

360. There exists a token of 1585, "entitling the poor to a place in the new cemetery, free of expense."

Woodward twenty-fifth sale, Dec., 1879, No. 1269.

Akin to these last is the following American token of a tombstone maker.

361. Obverse. Upon two bases, a gravestone inscribed, In | Memory | Of Reverse. Inscr.: A. Mester & Co. | Marble Works, | Eaton Rapids, | * Mich. * Brass and copper. Fonrobert (Nord-Amerika), Nos. 2466–67.

Coin Collectors' Journal, vii., p. 154, no. 5.

In this connection are to be classified, numismatically, the other tokens relative to mourning, such as :

A. UNITED STATES.

(*a*) *New York.*

362. Obverse. * M. Leask 93 Prince St. Near Broadway. New York. (&c. &c.) Reverse. Manufacturer of Mourning (&c.) Goods (&c.) White metal. 20.

Ibid., x., p. 88, no. 145.

B. ENGLAND.

(*a*) *London.*

363. Obverse. Inscr.: Early Townsend & Co. | 324 | & 325 | Holborn | London. Reverse. Inscr.: Family Mourning (&c. &c.)

Neumann, No. 26,487.

364. Obverse. Inscr.: T. Pryce, Oil & Colourman (&c.&c.) London. (In the Woodward sixty-ninth Cat., no. 1484, it is wrongly given as Price.) Reverse. Inscr.: Sole Manufacturer, | Of | Dr. Winn's | Black And | Blue | Reviver For | Restoring | All Kinds | Of | Faded Mourning. (About 1830.)

Ibid., No. 26,524.

This is in my collection. As to who was "Dr. Winn," I am as yet uncertain. The case is similar to that of "Dr. Selleck," on two of the tokens of Chesebrough, Stearns & Co., of New York, both of which I have.

To complete this series numismatically, there should be added the various funeral medals, as of the conveyal of Napoleon's remains to the Hôtel des Invalides, of which there are several varieties, and that of Louis XVIII., which I have.

Neither the true "mortuary" medals, however, nor the following should be hastily placed in the present category.

Pontefract, 1648. Charles II. Post. Mortem. (&c. &c.) Silver. Octagonal.

Duby, "Récueil général des pièces obsidionales et de necessité," Paris, 1786, pl. xvi., no. 6.

Norblin Cat., 1855, no. 2987.

VII. *Ventilation.*

A. United States.

Benjamin Franklin. "On the Causes and Cure of Smoky Chimneys." (In a letter to Dr. Ingenhousz.) Philadelphia and London, 1787.

There are a great many Franklin medals, both American and foreign. Perhaps the one most interesting of them all to describe in the present connection is that which in part is dedicated to Monthyon, of Paris, one of the prizes founded by whom is awarded by the French Academy of Sciences for such discoveries as shall render some mechanical art less unhealthy.

365. Obverse. The two busts, jugate, to left. Beneath, Barre. Inscr.: to the left, Franklin, Bienfaiteur Du Génie: to the right, Montyon, Génie De La Bienfaisance. (Duisburg wrongly repeats Bienfaisance in the first portion of the inscription, instead of Bienfaiteur.) Reverse. Oak branches

tied by ribbon. At base, a star. Within them, Les | Souscripteurs | Associés Pour | Propager L'Histoire | Des Bienfaiteurs | De L'Humanité | 1833. Inscr.: Société Montyon Et Franklin Pour Les Portraits Des Hommes Utiles. Bronze.

Kluyskens, ii., p. 234.

Duisburg, p. 226, DXCIX., no. 10.

Franklin will be again referred to in Section X., Inoculation. I may here mention, what does not seem to have been noted, that there exists a composition medallion of Dr. Jan le Francq van Berkhey, of Leyden, the portrait bust upon the obverse of which so closely resembles that of Franklin, that it might easily be mistaken for it, especially as there is no inscription. This is in my collection, and will be described in Section X., Vaccination.

Benjamin Thompson, Count Rumford. He wrote upon the construction of chimneys, with special reference to remedies for their smoking.

The Rumford medals have been described in Section III., Bathing, and will be again referred to in Sections VIII., Diet, and XII., Climate.

Dr. J .M. Toner, of Washington. "Free Parks or Camping-Grounds or Sanitariums for Sick Children of the Poor in Cities," Minneapolis, 1872; New York, 1873.

Dr. Toner's medals have been already described under Section I. He has also been referred to in Section II., Water Supply, and will again be mentioned in Sections X., Inoculation, Vaccination, Cholera, Yellow-fever, and Syphilis; XI., Military and Naval Hygiene; XII., Climate; and XIII., Registration.

B. ENGLAND.

Dr. Neil Arnott (1788–1874). "On Warming and Ventilating, with directions for making and using the thermometric stove," etc., London, 1838, 8°. "On the smokeless fireplace, chimney valves, and other means, old and new, of obtaining healthful warmth and ventilation," London, 1855, 8°.

Dr. A. received the Rumford medal from the Royal Society of London in 1854, and that of the Universal Exposition at Paris in 1855. The former was described under Section III.

He was also given the cross of the Legion of Honor. He will again be referred to in Section XII., Climate.

John Howard. One of the most essential features of his philanthropic work was the obtaining better ventilation for prisons.

The Howard medals and tokens have been described under Section I. They will again be referred to in Section X., The Plague.

It will be recollected that in Section III., Bathing, I described tokens of Eastbourne, Sussex, England, which also commemorated the "Pure Air" of that excellent health resort. See Nos. 149, 150, and 151.

VIII. *Diet.*

A. THE UNITED STATES.

Dr. H. I. Bowditch, of Boston. "Hippophagy," *N. Y. Med. Journal;* also separately, New York (1868), 8°.

Dr. Bowditch has already been mentioned in Sections I. and V., Drainage. He will be again referred to in the present section and in X., Epidemics; XI., Military and Naval Hygiene; and XII., Climate.

Benjamin Thompson, Count Rumford. "On the Selection and Preparation of Food." "Of the Excellent Qualities of Coffee, and the Art of making it to Perfection." "On Kitchen Fireplaces and Utensils (the 'Rumford Roaster')."

Rumford has already been spoken of in Sections III., Bathing, and VII., Ventilation, and will be again in XII., Climate.

B. FRANCE.

Dr. Hyacinthe Théodor Baron, Sr. (1686–1758), Dean of the Faculty of the Paris University from 1730-34. "An senibus chocolatae potus?"

366. Obverse. Bust to right. Beneath, in script, J. C. R(oettiers). Inscr.: H. T. Baron F(acultatis). M(edicinae). P(arisiensis). Decanus 1731.32 Reverse. Æsculapius, seated, points to a book, apparently instructing therefrom his cock and serpent. At his feet, to right, the shield of the Faculty, bearing the sun and three storks. Above this in monogram, J. C. R. (Roettiers.) Legend: Dirigit Ut Prosit. Exergue:

Pharmacopoea | Parisiensis. | 1732. Bronze; gilt do. 28 mill. 19.

Rudolphi, p. 11, no. 45.

Kluyskens, i., p. 63, no. 1.

Duisburg, p. 83, CCXXXVIII., no. 1.

Neumann, No. 31,210.

This is in my collection, from that of the late Dr. Chéreau, of Paris.

367. Obverse. As preceding. Reverse. A large dial, irradiated by the sun. In the distance, fields and mountains. Legend: Regit Me Et Dirigit Orbem. Gilt bronze. 19.

This is in my collection, from that of Dr. Chéreau, and was unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell. I fail, indeed, to find it anywhere described, and it is doubtless extraordinarily rare.

368. Obverse. Bust to right. Inscr.: H. T. Baron F. M. P. Iterum Decano. 1733.34. (In the last described token but one, it will be noted that the official title is in the nominative case, while here it is in the ablative absolute.) Reverse. Upon the left, four persons make an autopsy, or, rather, dissection. Beside the table, a shield with the Faculty Arms, a sun and three storks. At right, two surgeons amputate a leg. Legend: Majorum Sectantur Vestigia. Exergue: Baccal. Opera Anatom. | Et Chirurgica | Exercentes. | 1733. Bronze. 19.

Rudolphi, p. 11, no. 46.

Kluyskens, i., p. 63, no. 2.

Duisburg, p. 84, CCXXXVIII., no. 2.

Rudolphi had this in his collection, and it is in that of Dr. Fisher, of Sing Sing, N. Y. It is so very rare that Dr. Chéreau possessed but a cast of it, which I now own.

Rudolphi erroneously attributed to Baron, Sr., a jeton of 1754, which, however, belonged to his son, H. J. Baron, Jr., and has been already described, no. 163, under Section IV., Mineral Springs. The elder Baron will be again referred to in Section X., Syphilis.

Denis Papin (1647–1710). The inventor of the apparatus known as "P.'s Digester." "Manière d'amollir les os et de faire cuire tous sortes de viandes," Paris, 1682, 12°.

369. Obverse. Bust to right. Beneath, Borrel 1852.

Inscr.: Denis Papin. Reverse. Inscr.: Né A Blois 22 Aout 1647. Membre De La Soc. Roy. De Londr. 1681. Prof. De Math. A Marbourg 1687. Invente La Mach. A Vap. A Piston 1688. L'Applic. Possible A La Navig. 1690. Public Son Recueil 1695. Mort A Marb. 1710. Bronze. 50 mill.

Kluyskens, ii., p. 288.

A. A. Parmentier. Introduced the potato into France, which is commemorated upon his medal, no. 73. "Examen chimique de la pomme-de-terre." "Avis aux bonnes ménagères des villes et des campagnes sur la manière de faire leur pain." "Le parfait boulanger ou Traité complet sur la fabrication et le commerce du pain." "Expériences et réflexions rélatives a l'analyse du blé et des farines." "Recherches sur les végétaux nourrissants qui, dans les temps de disette, peuvent remplacer les aliments ordinaires." "Instruction sur la conservation et les usages de la pomme-de-terre," etc., etc.

He has already been mentioned in Sections I., IV., Mineral Springs, and VI., Sewerage, and will again be cited in Sections X., Vaccination, and XI., Military and Naval Hygiene.

C. Sweden.

Jonas Alstroemer (1665[Kluyskens; 1685, Duisburg]–1761). Introducer of the potato into Sweden.

370. Obverse. Inscr.: Inwight Hr. C. Rt. Och Riddaren Jon. Ahlstroemer Suenske Handaloedoern Otröttade Fostervader Af Ett Tacksamt Asyna Wittne. C(arl). G(ustav). T(essin). (To J. A., Councillor of Commerce, and Chevalier, the unwearied developer of Swedish manufactures, from C. G. T., an eye-witness, with lively gratitude.) 1753. (Rudolphi and Kluyskens have H. C. R., Alstroemer, Mandaslägdars, and Tessin's name in full. Kluyskens has also Taeksamt. Duisburg has Handalslaegderen, Otröltade.) Reverse. A spider spinning its web. Legend: Till Hembygdens Fördehl (To the advantage of our country). (Rudolphi has Til.)

I copy the inscriptions from MS. notes in my possession by Prof. B. Friedländer, who owned the medal. Silver.

Berch. "Beskrifning öfwer Suenska Mynt," etc., Upsala, 1773, 4°, p. 354, no. 108.

Rudolphi, p. 3, no. 9.

Kluyskens, i., p. 13, no. 1.

Lengnich, "Merkwürdigkeiten," p. 674.

Duisburg, p. 199, DXXX., no. 1.

371. Obverse. Bust. Inscr.: Jon. Alstroemer Consil. Comm. Et. Equ. Aur. Reverse. The Arms of the Swedish Academy of Sciences. Inscr.: Regia Academia Scientiarum. (Rudolphi and Kluyskens omit the inscription.)

Berch, p. 354, no. 109.

Rudolphi, p. 3, no. 10.

Kluyskens, i., p. 13, no. 2.

Duisburg, p. 199, DXXXI., no. 2.

Struck by the Swedish Academy, in 1769, in honor of Alstroemer's being Dean.

372. Obverse. Bust. Beneath, Ljungberger. Inscr. as in preceding. Reverse. Pan seated, amid fields. Legend: Curat Oves Ovlumque Magistros. Exergue: Senior Meritiss. Acad. R. Sc. Sv. Silver. 35 mill.

Lüdecke, i., p. 211, no. 6.

Rudolphi, p. 3, no. 11.

Duisburg, p. 199, DXXXI., no. 3.

Also struck by the Swedish Academy.

373. Obverse. As preceding. Beneath shoulder, E. Reverse, Hygeia, near a fir-tree. Legend: Hic Labor Hinc Laudem. Exergue: Fabr. Per Patriam Instaur. Silver.

Duisburg, p. 199, DXXXI., no. 4.

In the Imperial cabinet at Berlin. Unknown to Rudolphi and Kluyskens.

D. Italy.

Dr. Antonio Cocchi. "The Pythagorean Diet, of vegetables only," London, 1745, 8°.

Cocchi has already been mentioned in Section IV., Mineral Springs, and will again be cited in Section X., Small-pox, No. 182.

Dr. Fortunio Liceti, of Padua (1577–1657). "De his qui diu vivunt sine alimento libri quatuor," Padova, 1612, fol.

374. Obverse. Bust facing. Inscr.: Fortunius Licetus Med. Et Pr. Prim. Pat. (engraved). Reverse. Mercury pursuing a fawn. Legend: Fortasse Licebit. Silver, tin, bronze. One and a third inches.

Rudolphi, p. 94, no. 395.

Kluyskens, ii., p. 150.

Duisburg, p. 18, XLVI.
Renauldin, p. 118.
Durand, p. 107.

In this place belong what are generally known as Temperance medals. As the word Temperance has by usage come to be applied to the abuse and even use of alcoholic drinks and tobacco alone, and in the sense of total abstinence therefrom, the same is equally true of its medals. Strictly speaking, however, medals relating to the abuse of food would come within the present classification, and also the allegorical ones which have served the purpose of satire. Of the latter, there are the following :

375. Obverse. A man endeavoring to swallow the globe. Reverse. Hands and money. White metal. 23.

Wilder Cat., 1879, no. 1097.

376. Obverse. A clergyman vomiting money into a sack, which is supported by a galley-slave. Inscr.: * Rendez A Cesar Ce Qui Appartient A César * | Indigestion D'Escobard. Bronze. 21.

This medal, Belgian, is in my collection. I have received an interesting account of its history from Mr. De Witte, of Brussels.

A. The United States.

Dr. H. I. Bowditch, of Boston. "Analysis of the Correspondence on the Use and Abuse of Intoxicating Drinks throughout the Globe, which was presented to the Legislature (of Massachusetts) in 1871 ; or, Intemperance as seen in the Light of Cosmic Law," Boston, 1872, 8°. "Intemperance in New England—How shall we treat it?" Boston, 1872, 8°.

Dr. Bowditch has already been referred to in Sections I., V., Drainage, and the present, and will be again mentioned in Sections X., Epidemics ; XI., Military and Naval Hygiene ; and XII., Climate.

Dr. N. S. Davis, of Chicago (1817–), founder of the American Medical Association. "The Remedial Value and Proper Use of Alcoholic Drinks."

377. Obverse. Head, to right. Beneath neck, W. & C. Barber. Behind, N. S. Davis. Reverse. A wreath of laurel leaves. Inscr.: American Medical Association | * * | 1846. Bronze. 40.

For the history of this medal and the dies, see Trans. Am. Med. Ass., xxv., 1874, p. 48, and xxvi., 1875, p. 35. Though very rare, it is in the collections of Drs. Lee and Fisher and my own. I received my specimen from the friend of more than thirty years' standing, Dr. Davis himself. I shall refer again to work that he has done for sanitation in Sections X., Typhus, Cholera, Diphtheria, Surgical-fever, and XII., Climate.

In this connection, and on account of its extraordinary rarity, I will describe the other medal of the American Medical Association.

378. Obverse. Æsculapius erect, facing, resting upon his staff; a skull at his feet, to right. Reverse. Laurel boughs tied by ribbon. Field vacant for name of recipient. Inscr.: American Medical Association. | Organized 1847. Gold; bronze. 26.

This medal seems to have been awarded but once, in 1864, to Dr. S. Fleet Speir, of Brooklyn, N. Y., for an essay on the Pathology of Jaundice. Subsequent competitors have preferred to receive the award in money. There, therefore, should exist but one of these medals in gold. For impressions from this I am indebted to Dr. Speir. The field of the reverse contains the following inscription: Awarded | To | S. Fleet Speir M. D. | Of | Brooklyn | N. Y. (in script) | For The Prize Essay | June 7th 1864.

There is a bronze copy in the Lee Collection.

Dr. Benj. Rush, of Phila. (1745–1813). "Enquiry into the Effects of Ardent Spirits upon the Human Body and Mind," 1785.

His medals will be described under Section X., Yellow Fever.

Rev. John Wesley wrote in 1760, "Upon the Sin of Distilling and Selling Spirituous Liquors." There are a number of medals of his, several of which I possess.

Dr. John C. Warren, of Boston, to whose memoir on the Use of Alcohol reference was made in Section I.

There are so many Temperance medals that the merest list of them, though interesting and important, would be too long for the present paper. I will therefore enumerate but a very

few, the inscriptions of which bear directly upon the preservation of health.

379. Obverse. Head of Washington, with long hair tied by ribbon, to right. Beneath, Lovett. Inscr.: Washington Temperance Society. Reverse. Oak branches tied by a ribbon. Above, clasped hands. In field, We Agree To | Abstain From All | Intoxicating Liquors | Except For | Medical Purposes | And Religious | Ordinances. Inscr.: Temperance Declaration | Temperance Is The Fountain Of Health. Silver, copper, white metal. 27.

This is in my collection, in silver. It is no. CI. of the Appleton list of Washington medals.

380. Obverse. Nearly the same as preceding. Undraped bust of G. W., to right. Inscr.: Washington Temperance Society. Reverse. A domestic scene. Inscr. beneath: House of Temperance. 25.

Snowden. "Medallic Memorials of Washington in the U. S. Mint."

381. Obverse. Head of G. W., to right. Inscr.: Washington Temperance Benevolent Society. Reverse. A flowing fountain; two birds upon its edge, drinking, and two others descending. 14.

Ibid.

382. Obverse. An old-fashioned well-curb, with overhanging tree. A woman gives water to a traveller with pack on his shoulder. Inscr.: The Old Oaken Bucket. | Health. Reverse. Within a partial wreath of laurel, tied by ribbon, I | Will | Touch Not | Taste Not | Handle Not | The Unclean | Thing. White metal. 22.

Fonrobert (Nord-Amerika), no. 250.

This is in my collection.

383. Obverse. A similar well-curb, but of different design, upon which hangs a scythe. A man drinking from the bucket. Upon base, H. Legend: How Sweet From The Green Mossy Rim To Receive It | As Poised On The Curb | It | * Inclined To My Lips * (The tip of the sweep is under N in the word On, and the word It is midway between the ground and the word To.) Reverse. Pledged To Use No Intoxicating Drink As A Beverage. Within a circle, Temperance | Leads To | Health. Wealth | Happiness. | And Long Life | A. W. R. Brass. 16.

Ibid., no. 251.

This is in my collection.

384. Similar to the last, save that the tip of the well-sweep is under the T in The, and It is close to To.

This is in my collection.

385. Similar to the preceding, save that there is no H on the well-curb.

This is also in my collection.

386. Obverse. A similar curb, with scythe, etc., but of still different pattern. At the right, a large rose-bush, in bloom. Beneath, to left, Thomas Inscription as in preceding, but in a circle around the outer rim. Reverse. A wreath of large flowers and leaves, tied by ribbon. Above, clasped hands. In field: We Agree To | Abstain From | The Use Of All | Intoxicating | Liquors | As A Beverage Inscr.: Declaration Of The Cold Water Army. White metal. 24.

This is in my collection.

387. Obverse. A curb like the last, with rose-bush, scythe, etc., and inscription arranged the same, but beneath ground, B & S N. Y. Reverse. Inscr.: The Bearer | Of This Medal | Is A Recorded | Member Of The American | Young Men's | Total Abstinence | Society. White metal. 24.

This is in my collection.

The following, for the terseness of its legend, may be added:

388. Obverse. Head of Washington, with flowing hair confined by ribbon, to left. Inscr.: Washington | United States of America Reverse. Inscr.: To The Cause Of | * | Temperance | Ten Dollars | To | King Alcohol | Not One | Cent. Edges lined; rim milled. Copper gilt. 16. In imitation of the U. S. half-eagle.

Snowden. "Medallic Memorials of Washington in the Mint of the U. S.," p. 49, no. 92.

This is in the collection of the U. S. Mint and in my own, which comprises also many others of the Temperance series.

Some of these medals directly recognize that it is wholly within the province of physicians to determine what beverages, and the amount of them which, shall be considered within the bounds allowable for the preservation of health. As, for example, No. 379 and the following:

389. Obverse. Inscr.: Catholic Temperance Society, Kingston, Canada, 1842. A Greek cross, with irradiated angles,

inscribed: Pledge | I Promise | To | Abstain | From All | Intoxicating Drinks | Except Used Medicinally | And To Discountenance | The | Cause & | Practice | Of | Intemperance. Reverse. A large crucifix surrounded by rays. Within an inner circle, In Hoc Signo Vinces. 44 mill.

This is very rare.

McLachlan. "Canadian Temperance Medals," *Canadian Antiquarian and Numismatic Journal*, xiii., April, 1886, p. 50. Through some oversight, Mr. McL. seems to have omitted this medal in his "Canadian Numismatics," reprinted in the same year from the *American Journal of Numismatics*.

Other pieces still would more emphatically restrict the employment of alcohol within medical limits alone.

390. Obverse. A shield, with lamb, banner, and the monogram I H S, upon an altar with steps. Above, an irradiated cross, with angels, who place chaplets upon the heads of a man and woman, to the right and left. These bear banners, upon one of which is the legend, Sobriety, and upon the other, Domestic Comfort. Below, two children seated, etc. Reverse. Inscr.: Pledge . . . . . Except Used Medicinally And By Order Of A Medical Man (etc., etc.). The Total Abstinence Society Of Ireland. The Very Rev^{d} T. Mathew President. Founded 10 April. 1838.

In the U. S. Mint Collection.

The following is even more explicit:

391. Obverse. Much as the last, save with the legends: Peace On Earth Good Will To Men | Firm As An Oak Reverse. As preceding, save that it is: And Then Only By Order (etc., etc.). Roman Catholic | Total Abstinence—Association Tin. 36 mill.

Fonrobert (Nord-Amerika), no. 252.

This medal, by Davis, of Birmingham, though avowedly Catholic, was undoubtedly prepared under Protestant auspices, since the Church version of the Angelic Salutation to the Shepherds at the Nativity is different, and reads: To Men Of Good Will. I am confirmed in this opinion by another medal by Davis, in my collection, with the same obverse, but a decidedly non-Catholic reverse.

In this connection honor should be rendered to the great Irish apostle of temperance, who did so much toward the prevention of disease, both mental and physical, poverty, and

crime. I know of perhaps eleven Fr. Mathew medals in addition to those just mentioned, and possess several of them.

Besides Temperance medals proper, there are many tokens of temperance hotels and the like, but in number they by no means offset those of inns, taverns, and saloons. I will give but a single example.

392. Obverse. Inscr.: Sam^{l} Roberts | Temperance Hotel | 17 Button S^{t} | White | Chapel | Liverpool. Reverse. Armorial Shield, etc.

Neumann, No. 27,563.

Official tokens toward the suppression of intemperance have also their place.

393. Obverse. Inscr.: To | Prevent | The Abuse Of | Charity, In The | Consumption Of | Whiskey, | This Is Given To | The Poor, | In Dublin. | F. Reverse. Value | One Penny, In | Provisions (Only) | At 168 James's-Gate | 44 Low. Kevin. Street | 55 Upper-Coombe | & 23 Barrack- | Street. | 1797.

Ibid., No. 28,268.

This is very rare.

I stated under Section II., Water Supply, that medals representing flowing water had not merely been struck in commemoration of the founding of aqueducts, fountains, etc., but that they had been used allegorically for the purpose of inculcating great spiritual truths, and I instanced one or two in which the device of Moses striking the rock had been employed. A similar one is the following:

Pope Pius IX., 1867.

394. Obverse. Christ, standing upon a rock whence four springs flow, bestows wreaths upon Sts. Peter and Paul. Reverse. An inscription in twelve lines, commemorating the 18th centennial of St. Peter's Crucifixion. By Voigt. Silver. 44. Weight, 5½ oz. av.

Low sixteenth sale, 27 June, 1887, no. 243.

There is another medal of the same occasion, of smaller size and different device.

I have already intimated that not merely undue indulgence in drink, but the excessive use of narcotics, has been attempted to be checked through the means of medals. Indeed, these have been made incentives as well as preventives in both cases. In the former, the tokens and advertising cards of inns and

saloons, and even beer and whiskey checks, form a special department of numismatics, however uninteresting it may seem. And so there can be no doubt that a taste for cigarettes and the pipe has been encouraged by the craze that exists among boys at the present moment for collecting what are called tobacco "tags." As an instance of similar direct encouragement may be cited the following:

395. Obverse. Bust of a plethoric old fellow with cigar in hand, half facing to left and blowing a cloud of smoke. Legend: No Pleasure Can Exceed | The Smoking of The Weed. Reverse. Within a wreath of leaves a cigar-box, upon the side of which a crown surmounting the word Regalias. Above, two crossed pipes. Inscr.: Levick 904 Broadway | New York Exergue: 1860 Edges milled. White metal. 18.

This is in my collection.

To such as the above there is the antithesis.

396. Obverse. A boy trampling upon a tobacco plant. Legend: I Will Never Use Tobacco | * In Any Form. * Reverse. Legend: Tobacco, | Tends To Idle | -ness, Poverty, | Strong Drink, | Vice, | Ill Health, | Insanity & | Death! Edges beaded. Brass. 16.

Fonrobert (Nord-Amerika), no. 255.

This also is in my collection.

The tokens, etc., of tobacconists form a group by themselves, and are beyond our limits. Among them are even governmental medals, as:

Pope Pius IX., 1863.

397. Obverse. Bust of the Pontiff, by Bianchi. Reverse. View of the State Tobacco Factory. Legend: Nicotianis. Foliis. Elaborandis | Officinam Aptiorem (etc.). Silver. 27.

Low sixteenth sale, 27 June, 1887, no. 236.

In this connection come also the "Wealth of the South" series, which, however, there is reason to believe, though Rebellion tokens, were struck in a Northern State. They bear, with other plants, tobacco.

The American tokens of bakers and millers, grocers and confectioners, butchers, milkmen, and general produce dealers are many in number, and though coming under the general term Diet, are not admissible here. I will merely allude to the more pretentious and very rare tin piece:

398. Dr. Ridge's Food For Infants and Invalids

Which was described in my paper upon the medals of Obstetrics and Gynæcology, and is in my collection.

Under the present head might have been included the large series of Famine medals. They are, however, even more appropriately connected with the medals of epidemics, to which they stand in the relation of cause to effect. In view of their number, interest, and importance, I shall devote to them a section (the next) by themselves. To end the present in a manner appropriate both to Hygeia and Diet, I will give the following tokens:

(*a*) *London.*

399. Obverse. Inscr.: May Good Digestion Wait On Appetite & Health On Both. In field, Open | From 5 A.M. | Till 11 P.M. | Good Beds | &c. Reverse. Inscr.: Euston Coffee. Soup | & | Chop House (etc.). White metal.

Neumann, No. 27,587.

(*b*) *Leipsic.*

400. Obverse. Inscr.: Hotel Stadt Dresden | * Leipzig * In field: Fritzsche Hunger (May you have a good appetite). Reverse. A foaming goblet. Inscr.: Gut Für Ein Glas Bier. Brass. Oval. 12 × 15.

This is in my collection.

(*To be continued.*)

EDITOR'S TABLE.

ANNUAL REPORT OF THE SUPERVISING SURGEON-GENERAL OF THE MARINE HOSPITAL SERVICE OF THE UNITED STATES, FOR THE FISCAL YEAR ENDING JUNE 30th, 1887.

This report is of great interest to both sanitarians and medical practitioners, because it is the almost exclusive source of official information on national measures for the prevention of epidemic diseases and the care and medical treatment of merchant seamen in the United States. Our review will be chiefly confined to that portion which treats of the prevention of epidemics.

Quarantine Service has been maintained at four stations—

Delaware Breakwater, Cape Charles, Sapelo Sound, and Ship Island, at which stations the number of vessels inspected were, respectively, 145, 129, 2, and 78. ". . . A few cases of yellow-fever were detected . . . on vessels from foreign ports arriving at the several quarantine stations. The sick in each case were admitted to the hospitals provided for the purpose and the vessels cleansed and disinfected."

Of the yellow-fever at Key West, which was first reported May 21st, 1887, there were from that date to September 14th, 282 cases, with 62 deaths. "June 30th"—after 51 cases had been reported and six weeks subsequent to the report of the first case—"a temporary refuge station was established by the the Marine Hospital Service at Egmont Key, where the unacclimated from Key West were received and cared for during the necessary period of detention, and their baggage was disinfected on that island." We took occasion in our January number to remark upon this refuge station for the population of Key West, that it resulted "in the removal of less than fifty persons thereto." It appears to have been the only measure instituted for the safety of the "unacclimated" people of that city, and if there was anything else done to prevent the spread of the disease among them it is not reported. But the Surgeon-General remarks:

"In January last I took occasion, in company with several health officers, to visit the coast of Florida, Key West, and Havana for the purpose of inspection of the sanitary state of those places, and I became satisfied that the establishment of a local quarantine station at or near Key West was absolutely necessary for the better protection of the Florida coast, and the interior States as well. This feeling was shared in by the health officers of the party, and a bill was introduced into the United States Senate for the establishment of such a quarantine station. I subsequently appeared before the committee of the Senate and made a verbal statement in support of the bill. The committee reported the bill back to the Senate, and recommended its passage, but the time was too short for action. Had this bill become a law it is strongly probable that the calamitous epidemic might have been prevented, for the first case, with all its belongings, would have been promptly sent to quarantine."

The failure of this bill should certainly have inspired all the "health officers" of the party who made the tour of inspection with the utmost exercise of other resources. But, failing in this good purpose, no other measures appear to have been suggested by the Surgeon-General or instituted by the local health officers thereabouts who accompanied him. However, even had it been otherwise—the quarantine established and the first *case*, with all its belongings, promptly sent to quarantine, with the same unrestricted freedom of commercial intercourse with Havana, whence persons (though not sick) with infected belongings were semi-weekly permitted to land at Key West—it appears to us strongly probable that the calamitous epidemic would *not* have been prevented, because all persons familiar with the nature of yellow-fever and the means by which it is propagated well know that the chief danger does not consist in the *personnel*—even in those affected with the disease—but in the *materiel*, and most of all in the ship which has been exposed, even for ever so short a period, to an infected locality. Yet these conditions make it all the more clear that an efficient quarantine station near Key West is eminently necessary.

The epidemic at Tampa and the means by which it was promoted we have before noticed (above referred to). The disease broke out there, we are informed, while the report before us was passing through the press; hence it is only mentioned in a foot-note.

With regard to foreign inspection service, it is remarked that:

"As no general regulation can be formed under existing laws whereby the disinfection of old rags can be accomplished in foreign ports to the satisfaction of the several health authorities, all old rags imported from foreign countries are admitted to entry at the custom-house only upon the production of permits from the health officers at the ports of importation."

Cholera is concisely noticed in Europe, in South America, and in the New York Quarantine.

The Weekly Abstract of Sanitary Reports, which have been of great utility to the health authorities throughout the country, and of interest to all sanitarians, is but briefly mentioned. It is earnestly hoped that if the Marine Hospital Service is to

continue to supplant the National Board of Health and to prevent the exercise of duties provided for in the Act creating that Board and defining its functions, this service, at least, may be extended and intensified; that *all* American consuls may be impressed with the importance of the duty, and, above all, the truthfulness, of the reports which they transmit. Knowing as they do that some communities are prone to delay, if not, indeed, to suppress or misrepresent knowledge of this character, they should at all times remember that their duty in this respect is to prevent the introduction of epidemic diseases into the United States, by timely notice of the sources of danger, without regard to the supersensitiveness of officials who may or who may not be responsible for the existence of such diseases in their midst.

With regard to *curative measures*, the report is replete with information on the marine hospitals, and, in their absence, contracts for the care of seamen and other persons who are constructively "seamen" under the law. In the exercise of these measures, the legitimate functions of the service, the work is alike creditable to the Supervising Surgeon-General and the Corps which he represents.

"Patients relieved, 45,314; treated in hospitals, 13,084; treated in dispensaries, 32,230; day's relief in hospital furnished, 333,701. This is the largest number of patients furnished relief in any year since the organization of the service."

Appended are a number of special reports, both medical and surgical, by the officers of the service, of interest to all practitioners.

The expenditures of the service for the year—"exclusive of repairs and preservation of the marine hospitals, fuel, lights, and water, furniture and repairs of furniture, etc., which were paid for out of special appropriations"—were $461,336.17. The receipts from all sources, $570,227.62.

THE NATIONAL BOARD OF HEALTH?

Germane to the immediately preceding review, and after it was in type, we received the following communication, which fully accords with our own sentiments:

NEW HAMPSHIRE STATE BOARD OF HEALTH.
(SECRETARY'S OFFICE), CONCORD, April 3, 1888.

Editor of THE SANITARIAN: At the second quarterly meeting of the State Board of Health, holden at the secretary's office at the State House to-day, the following preamble and resolutions were adopted:

"This country to-day does not possess a national health department, organically created, sufficiently equipped or so administered as to meet the approbation or confidence of State and municipal health authorities. The National Board of Health exists only in name, and is a useless organization, held together because the creating act has never been repealed, without funds, and inoperative.

"The United States Marine Hospital Service, a bureau of the Treasury Department created for a specific work, has undertaken to perform the functions of a national health department, but has signally failed to administer the duties of such a department in a manner satisfactory to the sanitarians, State and local health authorities of the United States. The State Board of Health of New Hampshire possesses documentary evidence showing the inefficient work of the United States Marine Hospital Service as a national health authority, and the health departments of the other States and of the Province of Ontario possess similar knowledge of its sanitary incapacity.

"These facts being generally known by the sanitary authorities of various States, there is a general demand for legislation that will prepare the country to resist more effectually the invasion of preventable diseases as well as to stamp them out more promptly whenever and wherever they appear.

"We believe it is time that the health of the citizens of this country receive at least as much consideration and protection from Congress as is accorded the cattle and swine of the nation. Therefore be it

"*Resolved*, That the State Board of Health of New Hampshire respectfully asks our senators and representatives in Congress to use their influence and votes to establish a Bureau of Public Health, with ample authority and funds to administer such a department properly.

"*Resolved*, That we endorse the provisions of H. R. bill 1526, 50th Congress, 1st session, entitled,

"A bill to prevent the introduction of contagious and infectious diseases into the United States, and to establish a bureau of public health.

"*Resolved*, That the secretary of the State Board of Health be requested to transmit a copy of this preamble and resolutions to each member of Congress from this State."

Very respectfully,

IRVING A. WATSON, *Secretary.*

DISEASES CAUSED BY IMPURE WATER SUPPLY.

E. P. VOLLUM, Lieutenant-Colonel and Surgeon, United States Army, Medical Director of the Department of Texas, in his report for 1887, under the caption of "*Statement of Miasmatic Diseases and Diseases of the Alimentary Canal at Fort Ringold, Tex., during Portions of the Years* 1886 *and* 1887, *as Effected by Impure and Pure Water Used for Domestic Purposes*," presents the following important illustration of the effects of impure water:

During the six months, January to July inclusive, 1886, while the command used the water of the Rio Grande for domestic purposes the number of cases of sickness were: of remittent-fever, 12; intermittent-fever, 19; dysentery, 2; diarrhœa, 20; colic, 5; number of days spent on the sick list, 510: percentage of sick to the command, 8.22.

During the corresponding months in 1887, while using distilled and filtered water for domestic purposes: remittent-fever, 8; intermittent-fever, 7; dysentery, 0; diarrhœa, 3; colic, 2; number of days spent on the sick list, 300: percentage of sick to command, 2.87.

"We have, in the Rio Grande, notwithstanding its great length and rapid current, a stream of the filthiest kind, that contains, for most of the year, large quantities of noxious constituents that predominate in the excreta and decomposing carcasses of animals that die along its banks and over its entire water-shed, together with a considerable amount of decayed vegetable matter and the lower forms of vegetable life, which render it unfit for drinking purposes for man or beast.

"THE WATER SUPPLY OF FORT DAVIS.—This port was in former years regarded as a healthy place to visit in the heated period, and it was somewhat resorted to on this account, but for the past year or more there has been an increasing number of cases of typhoid-fever, continued fever, dysentery, and diarrhœa, and the water supply, which at times is offensive to taste and smell, has been suspected of being the source of the increased amount of sickness, for it has been discovered that in families where boiled water was exclusively used, there was complete exemption from fevers and bowel complaints."

THE AMERICAN MEDICAL ASSOCIATION.

The Thirty-ninth Annual Meeting, to be held in Cincinnati May 8th, 9th, 10th, and 11th proximo, promises to be one of the most successful ever held.

The General Meetings will be held in the Cincinnati Music Hall, and the Sectional Meetings in adjoining rooms in the same building.

The Programme of the *Section on State Medicine* is, in part, as follows:

Chairman—H. B. Baker, Lansing, Mich.

Secretary—S.T. Armstrong, New York.

Address by the Chairman, H. B. Baker.

"The Causation of the Essential Fevers," by Victor C. Vaughan, Ann Arbor, Mich.

"The Internal Origin of Fevers," by J. A. Larrabee, Louisville, Ky.

"Atmospheric Temperature and Intermittent Fever," by Henry B. Baker, Lansing, Mich.

A paper by J. N. McCormack, Bowling Green, Ky.

"Report of Committee on Form of Law for Regulation of Practice of Medicine," by Perry H. Millard, Chairman.

A paper by E. O. Shakespeare, Philadelphia.

"Recent Discoveries and Researches with Regard to a Common Cause of Certain Infectious Diseases," by C. W. Chancellor, Baltimore, Md.

"Should the National Government Defend our Ports against the Invasion of the National Enemy, Contagious Disease?" by Benjamin Lee, Philadelphia, Pa.

"House Drainage," by Joseph F. Edwards, Philadelphia, Pa.

"Cremation of Garbage," by J. Berrien Lindsley, Nashville, Tenn.

"Eastern Carolina as a Residence for Tuberculous Patients," by J. M. Baker, Tarborough, N. C.

"Personal Prophylaxis against Malarial Disease," by George H. Rohé, Baltimore, Md.

"Hygiene of Infancy and Childhood," by F. B. Greenley, West Point, Ky.

The Members of the Section are expected to report upon the subject submitted by the Chairman, "*Malaria and the Causes of Fevers*," severally, which should not fail to bring out a great deal of practical information on one of the most important questions that engages the attention of sanitarians.

ASSOCIATION OF AMERICAN MEDICAL EDITORS.—The next meeting of the Association of American Medical Editors will be held in Cincinnati, Monday evening, May 7th. After the address of the President, Dr. William Porter, of St. Louis, the Association will consider a plan of organization reported by a committee, of which Dr. McMurtry, of Danville, Ky., is chairman. Officers for the ensuing year will be elected, and the Association will then discuss the following questions: 1. Is the multiplicity of medical journals an advantage to the profession? 2. How far do medical journals distributed by drug houses and manufacturers interfere with regular medical journalism?

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* reports for the month of February 52 deaths in a population estimated at 40,000, of which 15 were under five years of age; representing an annual death-rate of 13.6 per 1000. From zymotic diseases there were 2 deaths, and from consumption, 11.

CALIFORNIA.—Reports received by the Secretary from over 100 localities, in different parts of the State, indicate a very great amelioration in the prevalence of disease.

The absence of violent storms, severe rains, and the unusually warm weather that prevailed during the month of February, had a salutary effect in lessening the tendency to diarrhœa and dysentery, and mitigating the frequency and severity of pulmonary affections.

Measles is epidemic throughout the State, and, in some cases, so severe as to be mistaken for small-pox; especially in those cases where the eruption is very dark and markedly papular.

Scarlet-fever is noticed in Sacramento, Oakland, San Francisco, Sissons, Wheatland, Fort Bidwell, Ontario, Los Gatos, Etna Mills, Soledad, Lockeford, Anderson, Salinas, College City, and Maxwell.

Diphtheria and croup continue to prevail, but in an endemic form only. Although inspiring much less fear than small-pox, diphtheria is really much more fatal. In San Francisco 37 cases were reported during the month, and of these 15 died, a mortality of over 40 per cent. In Sacramento 12 cases were reported, with 4 deaths. Croup is the most fatal of all forms of diphtheria. The isolation of the patient and the most rigid sanitary supervision cannot be too earnestly enjoined in dealing with these cases.

Small-pox is on the decrease, and at present shows no evidence of epidemicity. In San Francisco, during the month, 115 cases were reported; of these 18 were Chinese—15 of them directly importing the disease from China. San Francisco is pre-eminently a city that shows the value of vaccination and revaccination, and its positive power to preserve a community from an epidemic of the disease. San Francisco has had small-pox in her midst for months; many of her streets reeking with filth, hundreds of her tenement-houses hot-beds for contagious disease, and yet small-pox is kept well under control, solely by the good sense of her people in getting vaccinated and revaccinated. If it were not for the constant importation of fresh cases from China, San Francisco would very shortly exhibit a clean bill of health as far as small-pox is concerned.

In Stockton 8 cases were reported during the month. Dr. Ruggles, the efficient health officer of that city, says the disease is under control, and with the extensive protection

afforded by vaccination, he does not fear any further spread of the disease. In Sacramento 2 cases were reported in the early part of the month. They are convalescent, and no new cases have appeared. San Diego reported 7 cases in the early part of the month. They are convalescent, and no new cases appearing since February 6th, the city may be declared free from the disease.

In Los Angeles there have been several cases; the exact number has not been furnished this office, but will probably not exceed 20. In San Pedro 1 case. In San Fernando 1 case; also 1 in Santa Barbara, 3 in Riverside, 5 in Salinas, and sporadic cases in Napa, Redwood, Santa Cruz, Cloverdale, Wheatland, Sissons, Red Bluff, Lockeford, Redding, Ione, Sierra City, Lincoln, Fresno, and Tulare City; in the latter 3 cases were reported. In Dunsmuir Dr. Van Meter reports 3 cases; in Gibson, 3 cases. It is also reported in Edgewood, Mokelumne Hill, San Andreas, and Murphy's. In Oakland there were 7 cases during the month, which is a decrease of one half from the previous month. In San José the number of cases has not been reported, but probably did not exceed 12.

San Francisco reports for the month: Deaths, 517; from small-pox, as just above stated; acute lung diseases, 56; consumption, 78; typhoid-fever, 8; croup and diphtheria, 21; measles, 5; scarlet-fever, 3. Annual death-rate, 21.12.

CONNECTICUT.—The Secretary reports that the total number of deaths reported by 142 towns, comprising a population of 690,655, for the month of February was 1097, representing an annual death-rate of 19.06 per 1000 of population. In 25 towns, comprising a population of 24.745, there were no deaths.

The general health of the State was not as good in February as in the month before.

Scarlet-fever is still prevailing very generally through the State, and is reported from the following towns: Avon, Bristol, Canton, Cromwell, Hartford, Hebron, Killingly, New Haven, Norwalk, Stamford, Thompson, Torrington, Waterbury, Wallingford, Westport, and Wethersfield, with 15 deaths against 28 in January.

Diphtheria and croup had also a reduced mortality, though

still widely prevalent. These were reported from Bloomfield, Bridgeport, Bristol, Clinton, Danbury, Enfield, Glastonbury, Hartford, Madison, Meriden, Naugatuck, New Britain, New Haven, New London, Norwalk, Norwich, Portland, Putnam, Salisbury, Stamford, Stratford, Voluntown, Waterbury, Watertown, and Westport, with 40 deaths against 67 in January.

Typhoid-fever was reported from Killingly, Middletown, Norfolk, Portland, Southington, and Washington.

Meteorological conditions for the month, New Haven: Mean humidity, 74.4 per cent; mean dew point, 20.2. Number of clear days, 8; fair days, 12; cloudy days, 9.

DELAWARE.—*Wilmington* reports for the month of February 87 deaths in a population estimated at 57,000, of which 34 were under five years of age; representing an annual death-rate of 18.3 per 1000. From zymotic diseases there were 9 deaths, and from consumption, 16.

ILLINOIS.—*Chicago* reports for the month of February 1304 deaths in a population estimated at 840,000, of which 561 were under five years of age; representing an annual death-rate of 18.6 per 1000. From zymotic diseases there were 224 deaths, and from consumption, 132.

IOWA.—Fifth Annual Report of the State Board of Health for the fiscal period (biennial) ending June 30th, 1887, pp. 183. J. F. Kennedy, M.D., Secretary. Opening with a general rehearsal of the powers and duties, the report proceeds to give a sketch of the benefits of practical sanitation, and of the progress of its own work in particular in the execution of the Medical Practice Act and the prevention of epidemic diseases. The registration of births, marriages, and deaths, is still confessedly incomplete, because of the neglect of, and the want of sufficient power by the Board to enforce compliance with the law requiring reports of births and deaths by all physicians and midwives in the State; any attempt to report vital statistics is, consequently, it appears, omitted. The National and Provincial Conferences, and the proceedings of the American Public Health Association at its meeting in Toronto, 1886, are briefly reported upon. Other subjects indicating progress in practical sanitation during the period covered by the re-

port are more or less the subject of remark and commendation. Correspondence and circulars with regard to special localities, epidemics, and endemics follow, and after these essays on Typhoid-Fever, by the Secretary, J. F. Kennedy, M.D.; Hygiene of the Unborn, by G. C. Moorhead, M.D.; Tuberculosis in Cattle, by Professor M. Stalke, V.S.; and Thermometry of Hygiene, by D. Benjamin, M.D., of Camden, N. J. This paper is credited to *Carpentry and Building*, which borrowed it and the cuts from THE SANITARIAN, but did not have the courtesy to credit it; and no less remarkable is the circumstance that the accomplished Secretary of the Board failed to observe its priority in THE SANITARIAN two months before it appeared in *Carpentry and Building*.

The *Monthly Bulletin* reports for the month of February: *Davenport.*—Total deaths, 34. Diphtheria, 7; scarlet-fever, 4; membranous croup, 1; consumption, 4. Births, 36.

Keokuk.—Total deaths, 20. Membranous croup, 2; consumption, 6. Death-rate to 1000 population, 1.28. Births, 14.

Dubuque, January.—Total deaths, 42. Diphtheria, 1; consumption, 5. Death-rate, 1.5. Births, 28.

LOUISIANA.—Excerpt from the Biennial Report of the Board of Health to the General Assembly of the State of Louisiana, 1886–87. In this excerpt of thirty-seven pages and illustrations, Dr. Joseph Holt, President of the Board, gives a succinct account of the measures and methods he has devised and successfully applied for the protection of the public health during his term of office, together with the number of vessels, whence, the nature of sickness on board, and remarks in relation thereto, during the years 1885, 1886, and 1887. With the processes of disinfection instituted at the Mississippi Quarantine by Dr. Holt—by bi-chloride of mercury, sulphurous oxide fumigation, dry and moist steam—the readers of THE SANITARIAN have already been made familiar, by his previous reports and special contributions. But this excerpt is of additional value to sanitarians, and to port health officers especially, by reason of the excellent illustrations of his methods, and the stated requirements imposed upon all vessels arriving at the quarantine stations of the State during the quarantine period—about May 1st to October 31st—yearly.

New Orleans reports for February 303 deaths in 180,000 white population, and 160 deaths in 68,000 colored population —making the respective death-rates 20.2 and 28.2 per 1000, and 22.4 for the whole population of 248,000. The deaths from zymotic diseases numbered 56, and from consumption, 76. There were 148 deaths under five years of age.

MARYLAND.—*Baltimore*, annual report, 1887, James A. Steuart, M.D., Commissioner of Health and Registrar. Population, estimated from police census, middle of August—white, 370,385 ; colored, 66,770 : 437,155. Marriages, 4412, 10.09 per 1000. Births—white, 7765, 17.74 per 1000 ; colored, 1262, 18.83 per 1000 : 20.65. Still births, 669, 1.53 per 1000 of population. Deaths—white, 6380 ; colored, 1992 : 8372. Death-rates—white, 17.24 ; colored, 29.73 : 19.16 ; 3477, or 42.17 per cent of the total mortality, was of children under five years ; and 1504, 18.02 per cent, were caused by zymotic diseases. Deaths from zymotic diseases, in the order of their greater numbers, were : Diarrhœal diseases, 790 ; croup and diphtheria, 302 ; typhoid-fever, 156 ; whooping-cough, 98 ; measles, 85 ; typho-malarial-fever, 55 ; scarlet-fever, 36 ; cerebro-spinal-fever, 19 ; 1097, or 13.10 per cent, were caused by pulmonary consumption.

This report is an admirable exhibit of executive skill in accomplishing a large amount of work and excellent results in default of the yet pending desideratum—the discovery of a *sewerage* system which the sanitary and civic authorities of Baltimore may deem good enough for adoption.

Mortality report for the four weeks ending February 25th : Deaths, 711, of which 253 were under five years of age. Death-rate, 21.13 per 1000. From zymotic diseases there were 94 deaths, and from consumption, 112.

MASSACHUSETTS.—*Boston* reports for the month of February 852 deaths in a population estimated at 400,000, of which 274 were under five years of age ; representing an annual death-rate of 25.3 per 1000. From zymotic diseases there were 88 deaths, and from consumption, 110.

MICHIGAN.—The Secretary writes that, for the month of

February, 1888, compared with the preceding month the reports indicate that bronchitis, influenza, and measles increased in prevalence.

Compared with the preceding month, the temperature in the month of February, 1888, was higher, the absolute humidity, the relative humidity, and the night ozone were more, and the day ozone was less.

Compared with the average for the month of February in the nine years, 1879–87, measles increased, and diphtheria, consumption of lungs, pneumonia, intermittent-fever, and scarlet-fever were less prevalent in February, 1888.

For the month of February, 1888, compared with the average of corresponding months, for the nine years, 1879–87, the temperature was slightly lower, the absolute humidity was slightly less, the relative humidity was the same, the day and the night ozone were considerably less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of February, 1888, at 40 places, scarlet-fever at 45 places, typhoid-fever at 17 places, measles at 39 places, and small-pox at 1 place.

During February a disease, variously named as a "common cold" and epidemic influenza, has been very prevalent. It has affected to an unusual extent the root of the tongue. It has run through families, neighborhoods, and schools. Physicians have sometimes been called, especially when the cold threatened to "settle on the lungs."

Detroit.—The Health Officer reports for the month of February 288 deaths in a population estimated at 200,000, of which 63 were under five years of age; representing an annual death-rate of 18.9 per 1000. From zymotic diseases there were 63 deaths, and from consumption, 38.

MINNESOTA.—February *Public Health in Minnesota* (latest number received) reports for the month of January: deaths, 998. Diphtheria leads in mortality—was reported in 49 towns in 35 counties—108 deaths, nearly 11 per cent of total deaths. Typhoid-fever, 42 deaths. Scarlatina in 7 towns in 7 counties—deaths, 11. Measles has been widespread and rarely fatal. Diarrhœal diseases, though of more than usual prevalence, have caused slight mortality. Of non-infectious diseases,

pneumonia caused 88 deaths in 31 towns in 26 counties. Consumption, 88 deaths; 38.4 per cent of all deaths for the month were of children under five years.

Winter cholera in Minneapolis is still the subject of inquiry. Many replies have been received to circular, but an exhaustive report is expected from the Health Officer of Minneapolis, and is awaited before further publications on the subject.

St. Paul reports for the month of February 147 deaths in a population estimated at 150,000, of which 62 were under five years of age; representing an annual death-rate of 11.09 per 1000. From zymotic diseases there were 27 deaths, and from consumption, 12.

MISSOURI.—*St. Louis* reports for the month of February 730 deaths in a population estimated at 420,000, of which 249 were under five years of age; representing an annual death-rate of 20.8 per 1000. From zymotic diseases there were 109 deaths, and from consumption, 71.

NEW HAMPSHIRE.—*Manchester* reports for the month of February 64 deaths in a population estimated at 41,000, of which 18 were under five years of age; representing an annual death-rate of 15.6 per 1000. From zymotic diseases there were 9 deaths, and from consumption, 6.

NEW JERSEY.—*Paterson* reports for the month of February 146 deaths in a population estimated at 69,000, of which 60 were under five years of age; representing an annual death-rate of 25.4 per 1000. From zymotic diseases there were 22 deaths, and from consumption, 15.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 129 towns of 3000 inhabitants and upward, comprising a population of about 3,500,000, for the month of February, 8637, of which 32.0 per cent were under five years of age. In each 1000 deaths there were 154.00 deaths from zymotic diseases; of these 9.90 were from diarrhœal diseases, 9.89 from typhoid-fever, 27.83 from scarlet-fever, 77.69 from diphtheria. From all of these, and from all zymotic diseases, the death-rate is lower than in January; in February, 1887,

it was not far from the same. The reported deaths from small-pox all occurred in New York and Brooklyn; Cortland reported two deaths after the issue of the last *Bulletin;* new outbreaks are reported in Southeast, Putnam County, De Kalb, St. Lawrence County, and Saugerties, the last being in the person of an emigrant just arrived from Hamburg. There is no spread of the disease in localities previously reported. In each 1000 deaths, 128.46 occurred from consumption, and 295.00 from consumption, zymotic and puerperal diseases combined. From acute respiratory diseases there were 191.13 deaths per 1000 total mortality.

New York City, for the same month, population, 1,526,-081: Deaths, 3280, representing an annual death-rate of 27.00. Deaths under five years, 1266, 38.6 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 19; typhoid-fever, 14; typhus-fever, 1; malarial diseases, 22; small-pox, 3; scarlet-fever, 122; measles, 22; erysipelas, 21; whooping-cough, 22; croup and diphtheria, 268; diarrhœal diseases, 53; zymotic diseases per 1000 deaths from all causes, 172.90. Consumption, 472; acute respiratory, 751; puerperal diseases, 44.

Brooklyn, 757,755: Deaths, 1451; death-rate, 24.10; deaths under five years, 559—38.5 per cent of total. From zymotic diseases: Typhoid-fever, 5; malarial diseases, 8; *small-pox*, 16; scarlet-fever, 62; measles, 1; erysipelas, 7; whooping-cough, 6; croup and diphtheria, 142; diarrhœal diseases, 12; zymotic diseases per 1000 deaths from all causes, 172.41. Consumption, 174; acute respiratory diseases, 315; puerperal diseases, 15.

Buffalo, 202,818, for four weeks ending February 28th: Deaths, 379; death-rate, 24.35; deaths under five years, 159—41.8 per cent of total. From zymotic diseases: Cerebro-spinal meningitis, 3; typhoid-fever, 6; malarial diseases, 2; scarlet-fever, 14; measles, 9; erysipelas, 2; whooping-cough, 5; croup and diphtheria, 34; zymotic diseases per 1000 deaths from all causes, 202.63. Consumption, 39; acute respiratory diseases, 60; puerperal diseases, 4.

Annual Report of Health Department for year ending December 31st, 1886: Births and marriages reported, confessedly incomplete, respectively 6606 and 1607. Deaths,

3869—17.2 per 1000 of population (225,000); 1828 were of children under five years of age; 1015, or 26.4 per cent, were caused by zymotic diseases, the chief of which were: Diarrhœal diseases, 463; diphtheria and croup, 269; cerebro-spinal meningitis, 70; typhoid-fever, 61; scarlet-fever, 40; other fevers, 27. Four hundred and twenty-six, or 11 per cent of the total mortality, was caused by consumption.

The greatest evil with which the Department appears to have had to contend during the year has been privy-vaults; another fruit of this evil is shown in the excess of mortality from zymotic diseases. Yet these murderous "conveniences" are still allowed to a considerable extent even on sewered streets. It is safe to say that their total abolition would lessen the death-rate from zymotic diseases at the least two per cent. Are they worth *seventy-seven* lives a year? The suggestions of this conundrum are also earnestly commended to the attention of other communities where privy-vault abominations are in favor. In some, even to a much greater extent than in Buffalo, and, as a rule, proportionally with the extent of their tolerance, poisonous wells and other means of drinking and breathing the filthiest of all filth abound. Of 670 privy-vaults inspected, 52 were ordered cleansed, but none filled up (so far as shown by the report). This is a bad outlook for Buffalo, in view of the implied authority of the Board, by the Health Physician's statement that "the Board of Health would be justified in taking such action as would sweep every privy-vault from the city." Again, "49 wells ordered filled; . . . 11 filled; . . . 52 privy-vaults ordered cleaned; . . . 2 cleaned . . . by Street Department" (Street Commissioner's Report), is rather ambiguous to readers who take note of such things.

Of the milk supply: "18.35 per cent adulterated of 267 samples examined, while the remainder varied in quality from suspicious to excellent," demonstrates the necessity of continuous work in this direction also. In short, Buffalo is an inviting field for practical sanitation; for it is clear that, considering the disgraceful privy-vault system and consequent poisonous well water, with such a low death-rate as that which now obtains—assuming the correctness of the estimated population—it is capable of being rendered one of the healthiest cities in the world.

Rochester, 110,000: Deaths, 158; death-rate, 17.24; deaths under five years, 54—33.5 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 4; croup and diphtheria, 16; zymotic diseases per 1000 deaths from all causes, 125.00. Consumption, 21; acute respiratory diseases, 23.

Albany, 96,000: Deaths, 219; death-rate, 27.37; deaths under five years, 65—30.0 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 11; scarlet-fever, 4; croup and diphtheria, 7; diarrhœal diseases, 2; zymotic diseases per 1000 deaths from all causes, 120.00. Consumption, 33; acute respiratory diseases, 46.

Syracuse, 78,000: Deaths, 146; death-rate, 22.4; deaths under five years, 45—30.8 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 2; malarial diseases, 2; scarlet-fever, 1; measles, 10; erysipelas, 1; croup and diphtheria, 10; diarrhœal diseases, 3; zymotic diseases per 1000 of total, 200. Consumption, 15; acute respiratory diseases, 20; puerperal diseases, 2.

Lowest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the lowest death-rates during the month of February were: Lockport (15,000), 9.60; Ithaca (10,000), 10.80; Gloverville (10,000), 13.20; Jamestown (14,000), 13.71; Binghamton (25,000), 13.92.

Highest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the highest death-rates during the same month were: Saratoga Springs (10,000), 33.60; Edgewater (12,000), 29.00; Poughkeepsie (20,200), 28.51; Albany (96,000), 27.37; New York (1,526,081), 27.00.

NORTH CAROLINA.—February *Bulletin* (latest received) reviews the sanitary condition of 65 counties reporting for January. Pneumonia was the prevailing disease. Thirty-two counties reported the disease prevailing to more or less extent. Of these 6 were eastern, 16 were middle, 10 were western counties. Typhoid-fever came next, with 17 counties, of which 4 were eastern, 8 middle, and 5 western counties. Measles was prevalent in 9 counties, of which 5 were eastern, 2 middle, and 2 western. Diphtheria, which in December was prevalent in 13 counties, was reported from only 5 coun-

ties, the majority being in 3 middle counties. Whooping-cough occurred in 1 eastern county, 3 middle counties, and 4 western counties. Scarlet-fever was reported from 1 eastern county—New Hanover—and there the disease had about expended itself. Cerebro-spinal meningitis was reported from 1 middle and 4 western counties. In Buncombe County, in the city of Asheville, 26 deaths were reported, which represented a mortality of about 80 per cent. There was 1 case in Wilmington, which was carried to the city hospital and ended fatally. The patient sickened on board the revenue cutter Colfax while on a cruise.

The record of deaths for ten of the chief towns in the State, from Newbern in the east to Asheville in the west, gives some general items, as follows: From pneumonia there were 21 deaths; from typhoid-fever, 1 death; from malarial-fever, 7 deaths; from diphtheria, 1 death; from consumption, 24 deaths, the colored population in Wilmington contributing 7 of these; from heart disease, 4 deaths; from brain diseases, this including cerebro-spinal meningitis (reported only from Asheville), 32 deaths; neurotic diseases, 7 deaths; bowel disease, 4 deaths; 41 deaths from "all other causes"—that is, from diseases not considered dangerous to public health; from accident, 8 deaths; still born, 9 deaths. Deaths under five years of age, included in the above, 28.

Among the domestic animals we have report of an epizootic among horses in a middle county, and hog cholera in two western counties.

OHIO.—*Monthly Sanitary Record* for the month of February: 37 towns of 1200 population and upward, comprising 1,020,000, deaths, 1372; annual death-rate, 16.47; deaths under five years, 474; from zymotic diseases, 295—the chief of which were croup and diphtheria, 90; typhoid-fever, 57; whooping-cough, 252; measles, 12; cerebro-spinal meningitis, 10. Consumption, 173; pneumonia, 143. Of the total from zymotic diseases, 123 occurred in Cincinnati—41 from croup and diphtheria, and the same number from typhoid-fever.

Cincinnati (325,000), 495; death-rate, 18.27; under five years, 166; from zymotic diseases, 94; from typhoid-fever, 34;

croup and diphtheria, 24. Consumption, 74; pneumonia, 47.

Cleveland (225,000), 124; death-rate, 17.01; under five years, 124; from zymotic diseases, 80; croup and diphtheria, 37; typhoid-fever, 9; whooping-cough, 8. Consumption, 31; pneumonia, 35.

Columbus (90,000), 106; death-rate, 14.13; under five years, 28; from zymotic diseases, 18; croup and diphtheria, 6; typhoid-fever, 4. Consumption, 19; pneumonia, 10.

Toledo (76,000), 105; death-rate, 16.58; under five years, 44; from zymotic diseases, 15; croup and diphtheria, 4; measles, 3. Consumption, 18; pneumonia, 17.

Dayton (50,000), 57; death-rate, 13.68; under five years, 23; from zymotic diseases, 15; croup and diphtheria, 8; scarlet-fever, 2. Consumption, 4; pneumonia, 7.

Lowest death-rates were in Ashtabula, 9.23; Gallipolis, Mansfield, and Shelby, each 9.60; Huron, 10.

Highest death-rates were in Ravenna, 30.00; Marion, 28.80; Miamisburg, 28; Delaware and Shawnee, each 24.00; Waverly, 22.50.

PENNSYLVANIA.—The Secretary of the State Board of Health is distributing the following circular to the authorities of every town in the State:

PHILADELPHIA, March 15, 1888.

To all Local Boards of Health and Borough Councils in Pennsylvania:

This Board has received official information since the first of the year of the existence of small-pox in nine States of the Union. Two outbreaks have occurred in this State. The State Board of Health of California has declared it epidemic in that State. It is raging with great virulence in the neighboring island of Cuba, where sanitary precautions appear to be extremely lax, and with which we are in constant communication. It has prevailed extensively during all the past winter in portions of Great Britain. In the neighboring State of Delaware cases exist, and several deaths have occurred as the result of the importation of infected rags. This Board, therefore, deems it its duty to urge upon all municipal and

sanitary authorities the importance, first, of doing all in their power to promote vaccination in their respective communities, and, secondly, of keeping all new-comers and returned travellers, and especially all immigrants, under observation for fourteen days after their arrival, in order that, should symptoms of this disease manifest themselves, steps may be taken to circumscribe and isolate the centre of infection with the least possible delay.

By order of the Board,

BENJAMIN LEE, *Secretary.*

Philadelphia reports for four weeks ending February 25th, 1716 deaths in a population estimated at 1,016,758, of which 507 were under five years of age. Death-rate, 21.9 per 1000. From zymotic diseases there were 160 deaths, and from consumption, 258.

Pittsburgh reports for four weeks ending February 25th, 287 deaths in a population estimated at 210,000, of which 121 were under five years of age. Death-rate, 18.3 per 1000. From zymotic diseases there were 24 deaths, and from consumption, 27.

TENNESSEE.—The State Board *Bulletin* reports the principal diseases, named in the order of their greater prevalence, in the State, for February, were pneumonia, catarrhs, rheumatism, bronchitis, malarial-fever, consumption, tonsillitis, dysentery, and laryngitis. Measles were reported in the counties of Anderson, Bradley, Carroll, Davidson, Decatur, Fayette, Franklin, Gibson, Hancock, Hardeman, Hardin, Haywood, Knox, Lawrence, Lewis, Lincoln, Marshall, Maury, McMinn, Obion, Putnam, Robertson, Shelby, Stewart, Sumner, Tipton, Unicoi, Van Buren, Washington, Wayne, Weakley, and Williamson. Typhoid-fever in Anderson, Cocke, Davidson, Decatur, Gibson, Hamilton, Knox, Maury, Moore, Morgan, Putnam, Shelby, Washington, Weakley, and Wilson. Mumps in Blount, Coffee, Hancock, Hardeman, Knox, Lincoln, Marshall, Maury, Moore, Putnam, Robertson, Sumner, and Washington. Roseola in Carroll, Chester, Decatur, Gibson, Giles, Hardin, McMinn, Putnam, Rutherford, Tipton, and Williamson. Whooping-cough in Blount, Hardeman, Knox, Lincoln,

Marshall, Robertson, Sumner, Van Buren, and Williamson. Scarlet-fever in Davidson, Knox, Marshall, and Shelby. Diphtheria in Davidson, Hamilton, Knox, and Shelby. Cerebro-spinal meningitis in Bradley, Decatur, and Maury. Varicella in Maury and McMinn. Small-pox and varioloid in Madison—1 case each ; all precautions used.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga,	white,	11.50 ;	colored,	29.53 :	17.83
Clarksville,	"	19.20 ;	"	12.00 :	16.50
Columbia,	"	24.00 ;	"	.00 :	14.40
Knoxville,	"	9.76 ;	"	31.54 :	14.26
Memphis,	"	17.60 ;	"	39.04 :	25.21
Nashville,	"	10.03 ;	"	21.60 :	14.47
Tullahoma,	"	4.60 ;	"	.00 :	3.74

The *meteorological* features for February were high winds and disagreeable weather generally.

The mean temperature was 44.5°, slightly above the mean of the past five years. The highest temperature was 71°, recorded at various stations, on the 17th, 18th, and 19th, and was the lowest February maximum during the last five years except that of 1886, which was 70°. The lowest temperature was 4°, recorded on the 28th. With the exception of last year it was the highest February minimum during the past five years. The mean daily range was slightly less than the normal of five years.

There were four cold waves during the month, two of which came without any warning—viz. : 24th–25th and 26th–28th. In both instances—but particularly in the latter—there was a very decided fall in temperature, and on the last-named date the lowest temperature of the month was recorded.

The mean rainfall was 3.45 inches, nearly two inches less than the February mean of the past five years.

WISCONSIN.—Eleventh Annual Report of the State Board of Health, 1887, pp. 236. J. T. Reeve, M.D., Secretary. This report marks continued progress in the application of effective measure for the prevention of disease, and rejoices in another year of comparative freedom from epidemics. Fif-

teen thousand dollars is still, fortunately, subject to the disposal of the Board by special legislative appropriation, for use in the event of the coming of cholera; upon which it is well remarked, "In case of need for its use, the greatest prudence and economy must of necessity be exercised." The incompleteness of the registration of vital statistics, consequent upon the negligence of those whose duty it is to report *all* deaths, with the causes, especially, continues to be a grave obstacle in this State, as in several others, to sanitary progress. "When it can be shown by official returns properly authenticated that four deaths take place where, in the natural order of things, only three should have occurred, or when a health officer can show that typhoid-fever, habitually or frequently, prevails in a given locality, while another closely contiguous thereto and resembling it in all other respects is free from the scourge; or that the children in one part of the State are suffering and dying from zymotic disease of any kind, while elsewhere, other conditions being the same, there is no sickness of like character, he is in a position to affirm with confidence that something exists in the one place that is wanting in the others, and that with the removal of that thing or condition will come the disappearance of the disease."

Sixty-one pages are taken up with four special contributions: Disease-Germs and Germ Diseases, by Professor E. A. Birge, Ph.D., of the State University, Madison; Recent Progress in Preventive Medicine, by J. L. Kaine, M.D., Milwaukee; the Physical Side of Education, by Professor W. E. Anderson, Superintendent of Schools, Milwaukee, and Ideal Sanitation, by B. O. Reynolds, M.D., Lake Geneva. These papers are excellent summaries of their respective subjects, presenting truths of practical importance to all communities. Extracts from correspondence throughout the State follow, very few counties excepted. The whole number of local boards of health registered is 1049, of which 919 reported during the year; the neglect in regard to the remainder is attributed to the clerks.

Prevalent Diseases. "Reports from both professional health officers and laymen filling the same position show a marked increase in the amount of *diarrhœal diseases* in Wisconsin for the past two years. The number of cases reported is 10,187,

with 233 deaths, but it must be remembered that, as a rule, only the more serious cases are seen by a physician. . . . *Diphtheria*, which for some years past has been declining in the frequency of its occurrence and in the severity of its attacks, has within the last few months reappeared in pretty much all parts of the State. . . . *Scarlet-fever* has been extensively prevalent in nearly every part of the State. . . . The type of the disease has apparently been very mild, and few deaths have occurred. . . . *Typhoid-fever* has greatly extended, and the problem of how most effectually to deal with typhoid-fever in this State is becoming one of grave importance. . . . *Measles* has been more widely prevalent during the past year than for two or three years preceding. . . . The whole number of cases reported definitely is 4568, and 36 towns make indefinite reports. . . . *Whooping-cough* has occurred during the year to a greater or less extent in pretty much all parts of the State. . . . The whole number of cases definitely reported was 2655, with a death-rate of about 1.6 per cent. . . . As with scarlet-fever, there is no doubt that the number of cases that actually occurred was greatly in excess of the number reported. . . . " *Small-pox* made its appearance three times, but in each instance it was promptly controlled by the local health authorities.

Milwaukee reports for the month of February 278 deaths in a population estimated at 185,000, of which 67 were under five years of age; representing an annual death-rate of 18.0 per 1000. From zymotic diseases there were 34 deaths, and from consumption, 23.

SMALL-POX in the United States, as reported in preceding pages, still continues widespread in California, but it has ceased to be regarded as an epidemic in San Francisco or elsewhere in the State; and, under the energetic vaccination that is now being practised throughout the State, the Secretary of the State Board of Health anticipates its early extinction, except from the new arrivals at San Francisco, where it will be met and stamped out at the threshold.

The same may be said of its prevalence in Brooklyn and New York; all cases are isolated as soon as possible after discovery; vaccination is being pushed in all directions, but new arrivals from *abroad* continue despite the watchfulness of the

Health Officer of the Port. Indeed, it has rarely been so universally prevalent in modern times as during the past year; and it continues to prevail in foreign countries, from which an unusually large emigration to the United States is now taking place.

Summarizing our reports at hand for the last year, the number of deaths reported from small-pox was as follows:

Lisbon, 779; Warsaw, 668; Rome, 530; Paris, 389; Pesth, 373; Genoa, 358; Trieste, 282; Sheffield, 279; Prague, 259; Saragossa, 252; St. Petersburg, 224; Nice, 120; Pressburg, 70; Vienna, 65; Marseilles, 63; Havre, 62; Cairo, 47; Alexandria, 40; Port Said, 30; Bucharest, 22; Rheims, 16; Alost, 15; Bristol, 13; Nantes, 12; Jumet, 11; Lyons, 9; Nivelles, 9, and in 41 other places, from 1 to 8 deaths.

During the *four weeks* ending *March 24th*, deaths reported: London, 2; Manchester, 6; Dublin, 1; Leeds, 1; Sheffield, 85; Bristol, 4; Hull, 2; Paris, 29; Lyons, 4; Nantes, 3; St. Étienne, 1; Havre, 18; Rouen, 2; Rheims, 5; Trieste, 13; Vienna, 19; Prague, 85; Pesth, 2. During *three weeks* ending *March 17th:* Warsaw, 23; Rome, 13; Lisbon, 12. During the *month of February:* Marseilles, 12. *January:* Besançon, 10; Nice, 7; Rochelle, 1; Milan, 43; Genoa, 39; Grenada, 91. *December:* Buenos Ayres, 109.

From Surgeon-General Hamilton's Abstract: During *three weeks* ending *March 24th:* Havana, 64; *three weeks* ending *March 19th:* Cienfuegos, 66; Sagua la Grande, 20; *two weeks* ending *February 26th:* Guayaquil, 23. Under date of March 3d, United States Consul at Martinique reports: "Small-pox in an epidemic form has been spreading here, and while it is difficult to arrive at the exact number of cases, there are presumed to be in this island nearly 3000 persons affected, there being 40 deaths or more during the past week."

CHOLERA (from Surgeon-General Hamilton's Abstract):

"*Callao.*—The United States Consul, in his despatch dated February 21st, 1888, states that 'the last official report respecting cholera in Chili, dated at Valparaiso the 18th instant, is not encouraging. It states "cholera north and south does not decline. Cases reported at Pisagua. Valparaiso, new cases, 21; deaths, 4; Santiago, new cases, 38; deaths, 10."

Pisagua is a port just north of Iquique, and dangerously near to Arica, from whence the distance to the Peruvian boundary at Ilo is insignificant. At Ilo a sanitary cordon is established, but no confidence is entertained regarding its efficiency. The sanitary board here is now called upon to renew its endeavors to prevent all communication with the infected districts. The public health of Lima and Callao continues to be satisfactory. A cable message has just been received by the Government at Lima from the consul at Iquique, stating that no cases of cholera have appeared in the Department of Toropaca, in which are comprised Iquique and Pisagua.' And under date of March 3d, 'From the last report of Dr. Matto, the medical representative of the Government of Peru in Chili, it would appear that the ravages of the cholera in that republic are nearly concluded. Under date of the 1st instant, Dr. Matto reports by cable: "Have returned from the south. Cholera declining. Has disappeared at Concepcion, Angol, Angeles, Chillan, Parral, and San Fernando. Cases still at Loto and Coronel. None at Talcahuano. At La Serena (to the north), Santiago, and Valparaiso, decreasing." The condition of the public health at this port and Lima continues to be satisfactory.'

"*Santiago, Chili.*—The United States *chargé d'affaires ad interim*, in his despatch dated January 31st, 1888, with reference to cholera, states that 'the disease has not increased, but rather gradually diminished here. The average number of deaths from it daily, which at the latter date was about 20, has declined to from 10 to 12. This in a population of 200,000 inhabitants is not alarming. About the middle of December the disease appeared in Valparaiso, spreading with unusual rapidity, causing the number of deaths to exceed 30 a day in a population a little more than half that of the capital. Happily the disease has diminished there too, so that the number of deaths of cholera as published in the bulletins average from 8 to 12 daily at present. There is more or less cholera through the provinces, especially to the south, and the number of deaths from it may approximately be estimated from 30 to 40 daily. Wherever it appears it is promptly met by medical aid. There is no unusual excitement or fear manifested by the public, and business and amusements are going on as usual.'"

LITERARY NOTICES.

ATLAS OF VENEREAL AND SKIN DISEASES. By PRINCE A. MORROW, A.M., M.D., Clinical Professor of Venereal Diseases; formerly Clinical Lecturer on Dermatology in the University of the City of New York; Surgeon to Charity Hospital, etc. Imperial folio atlas, to consist of fifteen parts containing seventy-five chromo-lithographic plates, containing several hundred figures, many of them of life size, in flesh tints and colors, together with descriptive text for each plate, and from sixteen to twenty folio pages of a practical treatise upon venereal and skin diseases; the whole to form one volume. In the composition of the work, besides Professor Morrow many of the most distinguished authorities on the subjects treated of have been secured as contributors; among them Kaposi and Neumann, of Vienna; Hutchinson, Fournier, and Hardy, of London; Ricord, Cullerier, Besnier, and Vidal, of Paris; Leloir, of Lille; Keyes, Fessenden, and Piffard, of New York; Hyde, of Chicago, and others.

Fasciculus III. of this comprehensive work contains five plates of figures, all colored after nature and most of them of natural size, representing the following subjects: Chancre of Forefinger, with Syphilide of Palm; Chancre of Female Nipple, with Syphilitic Roseola; Erythematous Syphilide; Milliary Syphilide (Lichen Syphiliticus); Papular Syphilide, with Precocious Ulcerative Lesions; and Papulo-pustular Syphilide. In the differential diagnosis of chancre and chancroid diseases, and in the classification of syphilides, the closely related lesions and conditions are grouped with special reference to their respective analogies and order of succession; and the combination or blending together of elementary lesions is expressed by compound names, as musculo-papular, papulo-pustula, papulo-tubercular, etc., promotive of a quicker appreciation of their nature, and well calculated to enhance the value of the work. The text is singularly lucid throughout—co-ordinately with the excellence of the plates.

LECTURES ON DISEASES OF THE HEART. By ALONZO CLARK, M.D., LL.D., Emeritus Professor of the Principles

and Practice of Medicine, etc., College of Physicians and Surgeons, New York. 8vo, pp. 251. Price $2.75. New York: E. B. Treat.

The author of this book, recently deceased, has been so long, so favorably and extensively known as one of the most skilful diagnosticians of the diseases of which it treats, that the only needful notice of it is its announcement. It embodies the substance of his teachings and lectures on "Diseases of the Heart" given to his students. Nothing appears to be omitted which would tend to give a clear exposition of the views which he inculcated as teacher.

It cannot therefore fail of being of great value to practitioners and students.

It gives emphasis and increased interest to this book to know that it is the only portion of Professor Clark's many and valuable contributions, lectures, and teachings given to the profession in substantial form.

MODERN HOUSES AT LOW COST: SIXTY DESIGNS, ILLUSTRATED AND DESCRIBED. Price 25 cents. By R. W. SHOPPELL, 63 Broadway, New York. This is a very useful and timely publication, displaying artistic taste and economical features which render it commendable to all who would avail themselves of such knowledge.

PREMATURE BALDNESS IN THE UNITED STATES, by ARTHUR RICHARD DEACON, St. Louis, Mo., is a neatly bound essay of twenty pages, which attributes the common prevalence of baldness in this country to excessive shampooing and the barbarous use of too much alkaline soap generally by as well as without the instrumentality of barbers. And closely akin to such soaps, the composition of numerous "hair tonics" is cited as of like effect in destroying rather than preserving the hair, and alike subject to just condemnation. In lieu of such mischievous practices, gentler methods of cleanliness and more soothing applications—with no claim to specificity—are advised eminently worthy of attention.

CHOLERA AND WATER IN INDIA. By M. C. FURNELL, M.D., F.R.C.S., Companion of the Indian Empire; Fellow of Madras University; Late Surgeon-General and Sanitary Com-

missioner, Madras, etc., etc. London: J. & A. Churchill. A pamphlet of forty-five pages, containing a large amount of the most important and practical information, not only with regard to the cause of cholera in India, but of fever, choleraic and other diseases everywhere. The relations of cholera and fever to foul water in India are demonstrated by an overwhelming amount of testimony, but even with more certainty in London and some other places where such diseases have been estopped by the substitution of pure for impure water; and doubtless many thousand lives might be saved annually in the United States by the practical application of the important facts adduced in this pamphlet. It should be possessed by every health officer in the country.

THE PUMP CATECHISM: A Practical Help to Runners, Owners, and Makers of Pumps of Every Kind; Covering the Theory and Practice of Designing, Constructing, Erecting, Connecting, and Adjusting. By ROBERT GRIMSHAW, M.E., Past President James Watt Association, No. 7, of New York, N.A.S.E., etc. Author of "Steam Engine Catechism," "Boiler Catechism," and many other practical works. Profusely illustrated. Third edition, price $1. New York: Practical Publishing Co.

The *third* edition of this manual, in about two years, is strong evidence of its practical utility and substantial advantage to the large class of readers interested in the subject of which it treats. We know of no other work on everything relating to pumps which gives so much information in such a condensed form.

THE THREE HOTTEST DAYS IN 1888. In his article on "Where to Spend the Summer," in *Scribner's* for April, General Greely, chief signal officer, makes a prophecy as to the hottest days in the year 1888. The Detroit *Journal*, taking the matter up, has offered a prize of $500 to the person guessing correctly, before June 1st, what the three days will be. General Greely immediately telegraphed his guess to the paper, in accord with his reasons in *Scribner's* for April.

"BOOK CHAT." During the first three months of 1888, *Book Chat* has indexed 524 new American and English works,

reviewed 124 new books, indexed 3627 magazine articles contained in 799 periodicals, and noted 145 French, 115 German, 34 Spanish, and 52 Italian books. Brentano's, Publishers, 5 Union Square, New York.

SCRIBNER'S for April contains a valuable and timely article by General A. W. Greely, Chief Signal Officer of the United States, answering the question, "Where Shall We Spend Our Summer?" He gives some pertinent advice as to the best time for taking a short vacation, and explains the conditions of climate which make some resorts preferable to others.

HEADS AND FACES, AND HOW TO STUDY THEM; a Manual of Phrenology and Physiognomy for the People. By Professor NELSON SIZER, Phrenological Examiner, and Dr. H. S. DRAYTON, Editor of the *Phrenological Journal.* 8vo, pp. 200. 200 illustrations, paper, 40 cents; extra cloth, $1. New York: Fowler & Wells Company, Publishers, 775 Broadway. A new edition of this work, making 40,000 copies in about two years, has just been published. Of all the interesting subjects which men and women study there is none more interesting or important than the studying of the characters of each other; therefore, if you want something to read that will interest you more thoroughly than any book you ever read, send for a copy of this book. It is sent by mail, postpaid, on receipt of price, as above.

JUDGE GEORGE C. BARRETT, of the Supreme Court, New York, before whom the "boodle" Aldermen and Jacob Sharp were tried, has written an article on "Miscarriages of Justice," which will appear in the *Forum* for May. The same number will contain "Obstacles to Good City Government," by ex-Mayor Seth Low, of Brooklyn; "Appropriations for Public Works," by Senator S. M. Cullom, and a strong article by Michael Davitt, on "Irish Landlordism."

PAINLESS CATHARTIC. L. L. Gray, M.D., Central City, Mo., says: "As a cathartic, I find acid mannate especially adapted to the treatment of children, being, in the first place, pleasant to the taste. It is well borne by the stomach, and its action is as certain as it is painless. In short, it is as indispensable as a cathartic as quinine is for malaria."

THE SANITARIAN.

MAY, 1888.

NUMBER 222.

THE OHIO STATE SANITARY ASSOCIATION.

PROCEEDINGS OF THE FIFTH ANNUAL MEETING HELD AT TOLEDO, FEBRUARY 9TH AND 10TH, 1888.

Professor E. T. NELSON, Ph.D., of Delaware, President.

(*Continued from page* 261.)

THE DUTY OF THE PUBLIC TO SANITARY SCIENCE.

By G. A. COLLAMORE, M.D., Health Officer, Toledo.

THE relations of sanitary science to the general public are those of benefactor and beneficiary. The objects of the former comprise all things which affect the life, health, or physical comfort of the latter. Sanitary science aims to oppose and counteract, and, if possible, remove or destroy whatever tends to shorten the life, injure the health, or give discomfort to mankind and the domestic animals. There is hardly a relation of life into which it does not enter. It takes into consideration the houses in which we live, the streets, railroads and boats on which we travel, the schools we study in, the churches we worship in, the places of amusement we frequent, the factories we work in, our places of business generally. It con-

cerns the infant, the youth, the adult. It takes cognizance of the air we breathe, the food we eat, the fluid we drink, the clothing we wear, the diseases which affect us and the form of death that smites us. In short, it is applied philanthropy.

It is the use of private knowledge for the public good. The acquisition of eminence in this field requires arduous study, extended and tedious experimentation, never-tiring zeal and courage. The field is so vast that no one man can hope to become an expert in all its divisions. This field is so constantly widening with the progress of science that more and more cultivators are ever demanded. There is no danger that sanitation will reach the limits of its ever-expanding horizon. To a certain extent it does now, and in the future it will surely command the services of the best intellects. For what more closely concerns a man in this life than the influences which tend to lengthen or shorten his life, to bring him health or disease?

I do not assume that any argument as to the necessity of sanitary science is required to convince you of the importance of the pursuit in which you are engaged. My aim is to show, in a general way, what is done, who do it, and for whose benefit it is done. Sanitary science exists for the benefit of the general public. Sanitarians derive no benefit from it, otherwise than that they constitute a part of the public. Such being the situation, it appears to me that the public owes certain duties to sanitary science and its devotees; the obligations, in justice, should be mutual, or at least not so completely one-sided as at present.

The most important duty, in my judgment, owed by the public, is to investigate and understand more thoroughly the aims and scope of sanitary science. It is only by a knowledge of what it offers that its importance can be appreciated.

There is a lurking suspicion in the minds of many that the advice and services of sanitary workers, so often gratuitously rendered, are inspired by some ulterior, if not selfish, motive. They cannot comprehend why something should be given for nothing, and, therefore, are led to doubt the sincerity of sanitary effort. A closer knowledge might convince them that there are persons who are satisfied merely to enjoy a common share in the benefits they confer on mankind. These are a

kind of missionary. The gospel they preach is that of cleanliness, second only to godliness. They desire to convert the public and will do so as soon as the public understands the tendency of their efforts.

The question of the prophylaxis and control of disease is one of the most important in sanitation. It includes not only individual prophylaxis, but that of families, communities, states and nations. It embraces isolation and quarantine, local and general. The problem how to keep out, if not prevent, is a very interesting one to sanitarians, and many of its elements are not yet fixed. It would much facilitate the solution of this problem if the profounder knowledge of scientists were supplemented by more general information on the part of the public, if the public were acquainted with a few elementary facts as to the origin and mode of propagation of infectious diseases.

It would be well, for instance, for the public to know that scarlet-fever, a contagious disease producing a large annual mortality, is produced by a specific poison which emanates from the person of the patient, and can be caused by no other means, and that this poison is remarkable for the tenacity with which it affixes itself to objects, which, if portable, may convey it long distances, and for its tenacity of life, which renders it difficult to destroy; that diphtheria, also a contagious disease, and largely fatal, may also arise from other causes than contagion, notably from fermenting filth, and requires, not only isolation but cleanliness for its extinction; that typhoid-fever and Asiatic cholera, while not directly communicable from person to person, are spread by the dejecta of their victims which contaminate the water supply, and thus that an efficient disinfection of these dejecta is a very desirable thing to accomplish; that small-pox may be exterminated by vaccination; and this, I am happy to concede, is a fact on which the public requires less information than most others, albeit there are sceptics here. It is evident that if the public knew how diseases arise and are disseminated, it would be prepared to more heartily and effectually second the endeavor of sanitarians to limit and subdue them. In proportion to its knowledge of sanitation would its zeal increase.

Again, it is a duty of the public to assist and promote the

organization of boards of health and other instruments designed for sanitary use. It should impress upon its legislators, whether municipal, State or national, the importance of wise legislation in these matters, and insist on having such laws as will best attain these ends. Legislators usually have sharp ears for the wishes of their constituents, and are easily convinced when the latter are in earnest. It is evident that legislation will only go so far as public sentiment is behind it. It is equally our duty to educate the public as for them to be educated in these things. Having secured wise laws, it is then the duty of the public to insist on their thorough execution. A machine will not run itself, neither will laws execute themselves. It is in the choice of suitable executives that the public is interested. It should demand that all laws designed to add to its length of days, its health, or its comfort should be as fully enforced as is possible. This duty it owes to itself as well as to sanitary science.

To what extent the public ought to be informed in what is called hygiene is a somewhat difficult question. That certain elementary knowledge is desirable, there is no doubt. The necessity of pure air and water, sufficiency of light, unadulterated food, the proper disposal of waste, proper methods of building and heating our dwellings, churches, schools, places of amusement, workshops, factories, even jails and prisons, in fact, of the proper conduct of our daily physical existence, should be understood in its vital elements, by all. The subject is now demanding increased attention, and the foundation of adequate information in these things is sought to be laid in the public schools. Here is a field for judicious work. The text-books to be introduced should teach what is required and not be the organs of one-idead enthusiasts.

In addition to the public schools, there are other institutions which deserve the acquaintance and support of the public. These are the direct offspring of sanitary science, and are daily giving forth results both astonishing and gratifying. I refer to those schools of bacteriology and other branches of investigation having in view the ascertaining of the causes of disease, and thereby the means of counteracting them, which have recently been established. The public should know of their existence, understand their purport, and give them their sympathy and support.

As a corollary, or result of the knowledge which the public should acquire as above suggested, would the final duty of the public appear to be evident. It is an eminently practical duty, and consists in paying for those things which sanitary science demands. In certain directions it must be conceded that the public contributes very liberally, and the tendency is to further enlightened liberality.

The medical men here present will testify that never have donations by private individuals to the cause of medical education been more freely offered than for the past few years. If the public thus appreciates the advantages of contributing toward the cure of disease, so much the more ought it to recognize the desirability of the prevention of disease. And yet you are aware that this is by no means the case. The organization of instrumentalities for the furtherance of sanitary science progresses but slowly. The great public, the chief beneficiary of these designs, is slow in thought, conservative, even careless. If stricken down by preventable disease, it is apt to cry out "Kismet" and submit unresistingly. Until the time comes when it can really believe that "Public health is public wealth," it is to be feared that progress toward the sanitary millennium will be none too rapid.

The National Board of Health, if not defunct, is dormant. What vital elements it lacked for further existence, I am unable to say. Yet it would seem that, as a central body, having in its charge national sanitation, it should have a sphere of usefulness inferior to none. State rights or local jealousies should have no place in the consideration of the preservation of the public health. If my house takes fire I will thank my neighbor for rescuing my family, even if I don't happen to have been introduced to him. The National Congress could do no better work than to rehabilitate this board and pour new blood into its veins by generous appropriations. A bureau of health, attached to one of the departments, might solve this problem.

Boards of health do not yet exist in all the States, and in many States thus provided it is astonishing how meagrely they are supported. In this great State of Ohio, with a population of over three millions, there is appropriated the pittance of $1600 per annum for a secretary, while the members of the board get $5 per day when on actual service. If the members

do not thus acquire wealth, surely the State is not impoverished. We hope to see the time when the public may see its duty more clearly in this matter, and be willing to support by vote and purse all efforts to improve its sanitary conditions. Until that time arrives we, as sanitarians, must continue our labors with the usually inefficient implements intrusted to us, and persevere in our education of the public to that point where it will need our instruction no longer, but demand, as its inherent right, the choicest results of sanitary science.

THE CONDITIONS OF HEALTH.

By Professor JOHN SIMPSON, Superintendent of Schools, Mansfield.

HEALTH is the state of body and mind opposed to disease, and is distinguished by the integrity and soundness of all the parts and functions which constitute a living being.

In the more restricted and ordinary sense, health is understood as referring chiefly to the body, pointing out the perfect and harmonious action of all its organs. It is a well-known fact that absolute bodily health is one of the rarest endowments, and that the best intellectual energies of man are called forth to counteract and stay the insidious advances of disease.

It has been asserted by a most eminent physician that disease is a part of nature, and so it belongs to things to be expected.

Even in deep-sea soundings in regions far removed from the so-called contaminating influences of civilization, the plummet brought up singular vegetable growths, some of which were found to be diseased, showing that in a remote region the evil influences of disease and disintegration exist even in the most simple and commonest forms of life.

If the disease is there, why not everywhere. The absolute and extreme duration of human life is uncertain. It is usual to regard as a healthy state of the system that in which a moderate degree of activity, without pain or inconvenience, is maintained beyond the limit of threescore years and ten. No considerable portion of human beings can approach this lon-

gevity. Even under the most favorable circumstances, and where the adults are more than uncommonly long-lived, there is always a considerable mortality at very early ages, and also a large number who die in early manhood and middle life.

Under the most favorable conditions of climate and sanitary appliances the average age of the human family is about forty-five years; and under less favorable conditions the average age is very materially diminished.

It is certainly possible to reduce the death-rate, as affecting premature mortality, and reaching out toward the ideal standard laid down by the sacred writer. It is well known that sanitary science has assumed large proportions of late years in consequence of the efforts that have been made to improve the sanitary condition of our great towns and extensive country districts, by imposing laws and regulations, the effectual execution of which has led to the extinction of many of the causes of epidemic disease.

The direct cause of the increase in population in any country (leaving immigration out of the count) is the excess of births over deaths, and this will result in the prolificness of marriages; on the proportion born which lives to marry; and on the interval of time between the age of death.

It seems to be contrary to the principles of human nature that early marriages should be united to longevity. The incentive to acquire wealth in early life is the main cause of early marriage, and it usually tells against longevity. Poverty is attended by insufficient food, clothing, and shelter; hence these conditions in large families are unfavorable to long life.

Imprudent marriages are, no doubt, a fruitful source of premature mortality which takes place all over the world. The death of one half of the human family under the age of puberty does not take place by virtue of any law of man's constitution, but from a disregard of the teachings of the laws of health. The conditions of civilized life compel obedience to a certain extent, but even these conditions are sometimes grossly violated, partly through ignorance and blindness of passion.

Influence of occupation and habits of life have a marked effect upon the healthiness or unhealthiness of mankind. All occupations have their peculiar dangers, which counterbalance

each other. The tailor is not exposed to the effluvia of the slaughter-house as the butcher is, and yet he has exercise denied the tailor.

Mortality varies with density of population, locality, and climate. From the very necessity of things, the evils growing out of these conditions cannot be wholly overcome by man's agency, but much may be done to ameliorate these conditions. It is a popular notion that a cold winter is conducive to life, but statistics prove the reverse.

Extremes of cold and heat materially affect the health of communities.

The history of the earliest civilizations records the fact that law-makers and public functionaries gave their most earnest attention within their limited means to the maintenance of the health and life of communities. It seems, in the last few years only, that the general public is becoming awakened to the importance of this subject, and thinks it is only of modern origin. Indeed, there seems to be a decay in the knowledge of the art of healing during the Middle Ages; and after this mental darkness began to disappear by the dissemination of Christian principles, an utter misconception of doctrine led to the neglect of all care of the human body.

The monks and friars gave themselves entirely to good works, as ministering to the sick, sheltering and clothing the homeless, but made no advances whatever in the possible prevention of disease. The neglect of ventilation and cleanliness of person, the accumulation of filth in their abodes, the poor quality of food, which was more poorly prepared, never entered their pious minds; and when disease and death overflowed their land, it was supposed to be a manifestation of God's special anger.

If we look back anterior to mediæval times, we find that great attention was given to the public health code by Jews, Greeks, Romans, and other nationalities not so far advanced in civilization.

The Roman people, intellectually crude as they were, and given to military matters to such an extent as hardly to find time to cultivate their lands, constructed a complete and stupendous system of drainage and sewerage for the city. Later the immense aqueducts extending for miles were built

to supply the city with the best water, and their splendid ruins at the present day attest the munificence and bountiful supply of the chiefest of sanitary requisites.

Free ventilation and good drainage were a recognized necessity among the Romans. A college of physicians was formed, whose duty it was to attend to the public health. The Theodosian and Justinian codes describe the modes of election of these state physicians.

The peoples of the present have been slow to profit by the good examples of the ancients, although all classes are far in advance in intelligence, in obligations to their fellow-man, and in their desire to ameliorate human suffering.

The first outbreak of cholera in this country, deplorable as it was in itself, was a great advantage in directing the public mind to the all-important subject of the prevention and stamping out of contagious diseases. It was a known fact that while the poor, living in unventilated and undrained hovels, with poor food and uncleanly habits, fell victims to this mysterious disease in large numbers, the better classes were comparatively safe.

In England investigations into the dwellings and domestic habits of the lowest class of the population revealed a state of things of which the general public had no conception. In consequence a new poor-law was passed, and a committee was appointed to examine into its workings. The report, says Professor Gardner, on the "Sanitary Condition of the Laboring Population of Great Britain," in 1834, principally treating of the sanitary condition of the poor, and the character of their dwellings, may be regarded as the true starting-point of modern sanitary legislation.

Fifty years ago in the populous cities of England and of the European Continent, we find the beginnings of this science in almost hopeless and aimless confusion; but its growth since then has been steady and immensely valuable. Harmony and order have been brought out of chaos, and a determinate method, and an approach to scientific exactness are assured.

The public mind should become better acquainted with the benefits which these investigations afford, and should strengthen and enlarge the fabric which is so ably supported by the strong arm of the medical fraternity.

One of the most important sanitary agents is the air—more properly the atmosphere, because it is the atmosphere we breathe with its ingredients so deleterious to health. The amount of air necessary to supply the respiratory organs so as to preserve a healthy condition of all the functions of the body is a question little thought of by the masses. People pursuing different avocations and in various circumstances in life must be supplied with fresh air commensurate with their wants.

In workshops, prisons, theatres, schools, mines, and hospitals the quantity varies greatly, and it is only by actual measurement that two or even three times as much pure air is required in some cases than in others to keep the carbonic acid at its normal proportions, and to remove the effluvia caused by the exudation of animal matter through the pores of the skin. It is difficult to determine the supply of fresh air required in various kinds of sickness; but an intelligent public should give its best thought to the sanitary condition of the sick-room, that the greatest comfort to the sick may be attained, and a speedy restoration to health be secured.

Effluvia and organic vapors of various kinds become developed in every occupied dwelling from daily cooking; and organic substances saturate all textile fabrics and become a fruitful source of disease. Ventilation is essential to eradicate these noxious vapors, and every room should be thoroughly aired each day by a current of fresh air sufficient to renovate its atmosphere and remove all impurities.

But the atmosphere may itself be filled with impurities, such as suspended matters, gaseous substances, and impurities from special causes. Some of these have a marked effect upon the health of various tradesmen.

In the vicinity of large factories, and in densely populated cities, the air becomes vitiated by the particles given off from the materials used in manufacturing and floating in the air; and by the continuous inhalation of impurities which affect the proper aeration of the blood. The proper regulations of the surrounding conditions of the body to the individual, family, or community are among the first subjects of importance in a hygienic point of view. The interests in which a large number of people are involved are not always subject to

their control; but the habitation of the small tradesman and the farmer can frequently be placed in such a locality as to secure thorough drainage.

This will insure freedom from the hurtful and insidious effects of the slow accumulations and stagnation of refuse substances.

The great purifiers of the atmosphere are diffusion, heat, cold, the action of the winds, and the fall of rain.

In sick-rooms, and in abodes infected with contagious disease, the agents ordinarily known as disinfectants are employed. Charcoal, dried earth, carbolates of lime and magnesia, are common among the solids. Among liquids and gases there are various substances held in the highest esteem, and which are readily accessible.

The chief impurities of water, the means of detecting them, and the modes of purification ought to be well known to the public.

Soil and climate occupy no unimportant place in the factors relating to health.

The porous nature of soil is conducive to the general health of a people. In regions broken by hills and mountain ranges the unhealthy portions are enclosed valleys and ravines where the air stagnates, and in clay soils where water is stored up, unless good drainage is afforded.

The climatic relations connected with the air have a marked influence upon the conditions affecting human life.

Temperature, humidity, movement, composition, and weight of the atmosphere are the most important. In emigration nationalities usually seek the same climatic conditions which exist in their native country, because they seem to flourish best under such conditions.

The quality and quantity of food, and the regularity with which it is taken, are of much hygienic importance. Food should be nutritious, of good quality, and properly cooked. The quantity of different kinds of food required for different persons and under varying conditions obviously fall within the domain of this subject.

The diseases connected with food are various and important. Deficiency and bad quality of food are sources of epidemic disease, generally fevers, and these of the most fatal kind.

The catalogue of causes affecting public health is entirely too long to be recounted here.

The medical profession is awakened to greater interest in the subject than ever before, and why should not the people generally manifest an equal interest in a matter affecting themselves, and in which they are capable of accomplishing great good.

Local authorities should be alive to their duties when informed by the State authorities.

The people should make themselves familiar with the general features of the localities where they live, with their previous sanitary state, with their existing provisions for health, with their soils, water, burial grounds, climatic conditions, and with whatever is necessary to secure healthfulness and long life.

As Lord Derby says: "With a low average of popular health you will have a low average of national morality, and probably also of national intellect."

Drunkenness and vice of other kinds will flourish in such a soil, and you cannot get healthy brains to grow on unhealthy bodies.

FOODS AND FOOD ADULTERATIONS.

By VICTOR C. VAUGHAN, M.D., Professor of Chemistry, University of Michigan.

SINCE particles of our bodies are constantly being worn away and cast out, new material must be introduced in order to make good the loss. Again, it is necessary that our bodies should be supplied with force or energy that animal heat, muscular movement, and nervous activity may be maintained. For these reasons foods are taken.

Foods may be defined as substances which, taken into the body, aid in building up or repairing tissue, or, by being oxidized or burned, generate force or energy.

Our ordinary foods consist of certain food-stuffs or elementary principles, together with a greater or less amount of wholly indigestible substances. Thus, oatmeal is a food containing the food-stuffs, gluten, starch, and fat, with a certain

amount of cellulose (cell structure) which is of no service to the body. The nutritive value of a food depends upon the kind and amount of these food-stuffs that it contains. Since no satisfactory discussion of foods can be carried on until we become acquainted with those constituents upon which their values depend, we will briefly consider the food-stuffs. Fortunately they are not numerous, and may be divided into the following classes :

1. Albumens or proteids.
2. Fats or oils.
3. Starches or carbo-hydrates.
4. Inorganic salts.
5. Water.

Albumens or Proteids.—To this group belong some of the most important food-stuffs. They all contain nitrogen, and for this reason the term "nitrogenous constituents" is sometimes used instead of proteids or albumens. The chief proteids are ordinary albumen, as the white of egg, casein of milk, fibrine of meat, gluten of grains and flour, and legumine of peas and beans.

The amount of proteid in the different foods is variable ; thus, meat contains from 15 to 23 per cent ; milk from 3 to 4 ; peas and beans from 23 to 27 ; grains and flours from 8 to 11 ; bread from 6 to 9, and potatoes and greens from 1 to 4.

When we remember that the blood, muscles, and all the vital organs contain proteids as their chief constituents, we can understand the importance of taking food rich in one or more members of this group. The average workingman requires in his daily food the equivalent of four or five ounces of pure proteid.

The digestive and assimilative organs have the power of converting one proteid into another, but they are not able to form a proteid out of a fat or a starch. For this reason no other food-stuffs can, without injury, be a substitute for the proteids in our food for any length of time. Fats, when oxidized or burned in the body, produce more force than will arise from the combustion of an equal weight of any other food-stuff. The workingman requires not less than two ounces of fat per day.

To the starches or carbo-hydrates belong a number of sub-

stances of similar chemical composition, and the majority belong to vegetable foods. The most important are starch, sugar, gum, and dextrine. Like the fats, they are consumed in giving energy to the body, though a much larger amount of carbo-hydrates is required to yield the same result to the body. The daily need of this food-stuff by the average workingman is between seventeen and eighteen ounces.

The nutritive value of a food will depend upon the proportion and kind of food-stuffs which it contains. However, there are many conditions which influence the nutritive value of a food. In order for this to be high, its constituents must not only be rich in food-stuffs, but they must be digestible. By improving the digestion, the appearance, odor, and taste of a food increases its nutritive value. It is also quite essential that the volume of food taken should be large enough to satisfy the appetite, and still not so great as to prove burdensome. For this reason, foods in certain food-stuffs are usually taken with some other food rich in these constituents.

Thus the potato, which contains not more than 2 per cent of proteids, is usually eaten with meat, which contains from 14 to 21 per cent of proteids; or we may say with equal propriety, that because meat contains no starch, man has learned to take with it the potato, whose chief constituent is starch. If one should attempt to live upon potatoes only, the weight of the food that he would have to take each day in order to get the minimum quantity of proteids upon which life could be sustained would not be less than ten pounds.

Dr. Edward Smith actually found some of the poorest Irish laborers confined almost exclusively to potatoes, and consuming the amount given above. This would lead to distention of the digestive organs, and render one dull and stupid. The digestive organs of plant-eating animals form from 15 to 20 per cent of the entire body weight. In flesh-eating animals the digestive organs form only from 5 to 6 per cent of the body weight; in man the proportion is from 7 to 8 per cent. Thus, man, upon this point at least, holds an intermediate position between flesh-eating and plant-eating animals, being more closely allied to the former than to the latter.

However, as the proper cooking of the food aids digestion, man may digest some of the vegetable food even more quickly

and completely than the ox can. But his food should not consist wholly of vegetable products. A certain amount of animal food, while not absolutely necessary to the maintenance of life, is essential to man's highest development.

That food is the most economical which contains the greatest amount of the most valuable food-stuffs for the least money.

The average workingman requires daily in his food, in round numbers, not less than four ounces of proteids, two ounces of fat, and eighteen ounces of carbo-hydrates. What combination of foods will furnish these for the least money? This is an important question; but in answering it, it should always be borne in mind that the foods suggested are to be healthy ones. A combination which would cost but little, but which would lead to dyspepsia or other ills, might in the end be quite costly.

The professor followed with several tables showing how cheaply a workingman can live, and at the same time obtain the required proportion of the different food-stuffs.

A large proportion of our daily food consists of material derived from the animal world. Other animals take vegetable food and build it up, so that it approximates in physical and chemical properties the flesh of man.

Of the foods thus derived from the animal kingdom, meat is one of the most important. Meat consists of different food-stuffs, as water, mineral salts, albumen, and fat. On an average 100 parts of beef consist of 72 parts muscle, 8 parts fat, and 20 parts bone. Veal contains 3 per cent more of water, and a corresponding amount of solid substance, than lean beef. The same is true of the difference between lamb and mutton.

Of all the kinds of flesh eaten, fat bacon contains the least amount of water. The average per cent of water in bacon is 60, while that in lean beef is 75. The flesh of wild fowl, chickens, and pigeons furnishes on an average 77 per cent of water. Fish is especially rich in water, the carp yielding 80 per cent. The fat in lean beef, veal, and mutton may be as low as from 1 to 1½ per cent, while that of fat beef is 14, of fat mutton, 9, veal, 6, and bacon, 24.

Along with these variations in the amounts of water and fat there are corresponding changes in the quantity of nitrogenous

material. As a rule, fish is poorest in nitrogenous substance, the per cent in carp and salmon being 13, in pickerel, 15 ; fat veal, mutton, and bacon, 15 ; fat beef, 16, lean beef, 22.

The following rules may govern us in the selection of meats :

Good beef has a reddish-brown color, and contains no clots of blood. Well-nourished beeves furnish a flesh which while raw is marbled with spots of white fat ; it is firm and compact. Old, lean animals furnish a flesh which is tough, dry, and dark ; the fat is yellow. Veal is slightly reddish, and has tender white fibres. The fat is not distributed through the lean, as in beef. The same is true of mutton. In well-nourished animals white fat accumulates along the borders of the muscles.

Pork is rose-red, and has fat distributed through the muscle. The lard is white, and lies in heavy deposits under the skin. The flesh of an old boar is dark, and often has an unpleasant odor and taste.

Good beef is not of a pale pink color, and such a color indicates that the animal was diseased. Good beef does not have a dark purple hue, for this color is evidence that the animal has not been slaughtered, but died with the blood in its body, or has suffered from some acute febrile affection.

Good beef has no, or but little, odor ; or, if any odor is perceptible, it is not disagreeable. In judging as to the odor of meat, pass a clean knife, which has been dipped in hot water, through it, and examine subsequently as to the odor of the knife. Tainted meat often gives off a plainly perceptible and disagreeable odor while being cooked.

Good meat is elastic to the touch. Meat that is wet and flabby should be discarded. It should not become gelatinous after being kept in a cool place for two days, but should remain dry on the surface and firm to the touch.

The flesh of young animals is more tender than that of the adult, but experiment, as well as experience, has shown that the former is less easily digested. For instance, veal and lamb are less easily digested, and tax the stomach of the dyspeptic more than beef and mutton. Dr. Smith has shown that this is largely due to the fact that the flesh of young animals cannot be perfectly masticated. The tissues of the young animal are less stimulating, less nutritious, and more gelatinous than the tissues of the adult animal.

On the other hand, it is well known that an animal may be so old and poorly nourished that its flesh well-nigh defies both mastication and digestion. The common breeds of cattle are best fitted for market at the age of seven years.

In many sections of the country calves of all ages are slaughtered. In some cities, as in Boston, the killing of a calf under one month of age for food is prohibited. It would be well if this law, or a more extensive one, should be enforced all over the country.

Veal is too often used simply as a dish to please the taste. As has been remarked, it is not nearly so nutritious as beef, and is much more difficult of digestion. Some persons are wholly unable to digest veal, and when they eat of it, it acts as a foreign body in the intestines and causes griping and diarrhœa. Dr. Smith states that it is more easy of digestion when well roasted or broiled than when boiled. The time required for the digestion of veal is five hours or more, while beef is digested in from two and a half to three hours.

As a rule, dried meats are more difficult of digestion than the same meats in the fresh state. Bacon and ham are, however, exceptions to this rule, for when well cured they are digested with more ease than fresh pork. In cold weather, nice bacon is especially suited for furnishing a large amount of heat by its oxidation in the body. The inhabitants of cold countries find fatty food necessary to their existence.

There is no bird that may not be eaten in case of necessity. In other words, the flesh of no bird is in itself poisonous. The same is true of the eggs of all birds. It is true that cases of poisoning from eating quails during spring have occurred; but the poisoning was due to the buds of the mountain laurel, upon which the birds fed. The flesh of carnivorous birds is strong in odor and in taste, and would not form a tempting dish, save to one threatened with starvation. The light meats of birds are more easily digested, less rich in nitrogen and in flavor than the dark meats. Chicken broth is more nutritious than that made from either mutton or beef, and is often of great value to the sick.

Undoubtedly the flesh of some fish is poisonous. A fish is supposed to justify suspicion when it has attained a size unusual for its species. This popular idea may have a grain of

truth in it. Fish should be discarded if the water in which it is being boiled blackens silver. The coloration is due to hydrogen sulphide (the gas of bad eggs), and indicates putrefactive changes. Decomposing fish has a pale look, and its belly is bluish. It is withered, sticky to the touch, and foul in odor. The seller sometimes tries to hide the evidence of decomposition by taking the eyeballs out and coloring the gills with blood.

Fish caught from putrid water should not be eaten. Sometimes near large manufacturing establishments where a great deal of refuse is thrown into the water, the fish are killed, and may be brought to market. The flesh of such fish is yellowish, soft, spongy, and of foul odor. Fish may be divided into those furnishing white and those furnishing red meats. Those of the former class, as the whitefish, are delicate and easy of digestion, while those of the second class are richer in nitrogen and more stimulating. Fish should not be left in the water after they are dead, but should be packed in ice.

The professor then took up the subject of sausages, and made the general assertion that there were very few adulterations. Many of the German sausages which had been called adulterations were not, as they were highly nutritious and easily digested.

Milk was next taken up. The professor made some humorous allusions to the practice of watering milk, and said that he had never known of more than 50 per cent of water being added, 10 per cent being the customary proportion. He gave some excellent suggestions about the way milk should be handled, and cut his lecture short with the remark that he had already taken up more time than he intended.

OXYGEN THE LIFE.

PURE AIR WITHIN-DOORS AND HOW TO OBTAIN IT.

By P. W. Search, Superintendent Public Schools, Sidney.

How wondrously wise was the kind Providence that surrounded us with this omnipresent, pervading, and diffusive ocean that we call the atmosphere! Who could imagine a

means better adapted for the accomplishment of its purpose than this ; difficult to escape from ; ever ready to offer a new and vital element and remove that cast aside ; diffusive in its handling of obnoxious and poisonous matter, and, in every way, under the control of magnificent laws for its movements, its purification, and its general economic properties. Man has only to appropriate to be blessed ; but, unfortunately, as the world has grown older man has not grown comparatively wiser in this particular. In his ignorance he has sought to establish a new order of things, to surround himself with barriers making appropriation difficult ; and hence the struggle of to-day is with *impure air*—impure because *vitiated*, and vitiated because man seeks to thwart the operation of beneficent laws by which nature would abundantly take care of her children.

I offer the following statements which I think will pass without question as truisms :

1. *The dangers from impure air increase with the massing of people together.* Consumption, a disease almost unknown during the colonization period, has increased with the growth of the country. Health resorts lose their distinctive character as is the tide of those there seeking relief. The one part of carbonic acid everywhere present in every twenty-five hundred parts of air is rapidly increased and the atmosphere surcharged by the breathings of a city ; and, besides, the decomposing matter exhaled from the lungs and the effluvia from the body rapidly increase the impurities consequent to the massing of people together. Hence, the difficulties naturally increase with the growth of a country. Happy are those cities so situated as to enjoy the benefits of lake, mountain, and ocean breezes.

2. *The architecture of the day is at fault in large degree for the character of the air we breathe.* We pride ourselves upon our stately buildings and see the parallel of the country's growth in the rise from the log-cabin to the mansion of to-day ; but has there not been a loss as well as a gain, a retrogression as well as a progression? Man's folly is nowhere better seen than in the air-tight buildings that deck the land. Within are proportion, ornament, tapestry, gilding, and convenience beyond even the vision of Aladdin, but no windpipe. The adequately ventilated building is the marked ex-

ception of the day. Homes, schools, churches, and State buildings are all alike in these glaring faults. The stately buildings in which we take so much pride, because of this one deficiency, are too often whited sepulchres without, but within full of impurities, effluvia, and slow but insensible death.

Now, I do not oppose but admire architectural beauty ; but I see no excuse whatever for the lamentable and damnable ignorance that builds these death-traps everywhere cursing our land.

I repeat the statement, therefore, that the character of our homes and other buildings of occupancy has much to do with the amount of impure air forced upon us.

The dread disease of mankind is consumption. That it is growing less or even remaining constant in its ravages and death-rate I think no one will advocate. Consumption was not a disease incident to the settlers of our country, nor is it one now on the frontier line. It comes with the tide and grows with the wealth. The old log-cabin, while it could not keep out the cold also could not keep out the pure air, and the exhalations and poisons of breath leaped to the old-fashioned fireplace and up the chimney with the fire-sprites. Furthermore, among the native American Indians there was practically immunity from consumption and lung troubles. Why was this so? Clearly because the Indian never tried to commit slow suicide by sticking his head inside an air-tight box. He breathed pure air because it was ever at command, and he could not help it. Now, I do not argue that we should reverse the order of civilization and go back to nomadic life, nor even to the log-cabin of days when ventilation was an inevitable thing ; but I do claim there is something suggestive in these facts, and that we will be wise if we give heed thereto.

3. In connection with the above I shall also make the statement, and I think a truism as well, that *more people are hurt by bad ventilation than by too little heat.* The facts in the case are that most buildings are kept too warm for health ; that by bad ventilation the blood is not sufficiently aerated in the lungs, making more artificial heat apparently desirable ; and, conversely, as pure air is made available, the temperature rises and we are kept warm with much less need of outside com-

bustion. It is astonishing how people may become so accustomed to breathing impure air as to not recognize its presence and superabundance. It must be remembered that the senses are not affected by impure air as they are by falling temperature, and therewith lies the chief danger. So it is that difficulties multiply about us, disease is encouraged within us, and we yield ourselves the willing victims to the insatiable maw of death. In considering this question it has seemed to me that the tendency of afflicted and diseased persons to find relief in climatic change by seeking the out-door life of the sunny South arises more than anything else from the necessity of getting away from the inadequate provisions of our places of abode.

Now, what is the necessity of having impure air within our homes? Scientifically and practically none. Is there not an abundance of pure air at our very door? Certainly, and to spare. Is it not wholesome? Is its appropriation sinful or forbidden? Is it difficult to obtain or expensive? There is but one answer to all of these questions. God's providence presents but the one means for aeration and purification of the blood and the removal of all effluvia; and that he does abundantly, freely, and completely. To live we must utilize the means; and in the building of our dwellings we must make adequate provisions for the admission of a flood of pure air, and also for its subsequent removal.

The necessity for a constant supply of pure air arises primarily from our need of oxygen, and for the removal of the poisonous carbonic acid and decomposing organic matter thrown off by the lungs. The air, by our breathing, thus doubly loses its vitality: First, by being robbed of its oxygen; and, second, by being charged with carbonic acid and other impurities. As the atmosphere is charged with oxygen for support of animal life, so is it also impregnated with carbonic acid for the vegetable kingdom. Hence, as we begin with the air, we find present, by original condition, about four parts of carbonic acid in every ten thousand parts of air. To say the least, it is not safe for us to breathe air charged with more than double this amount, and seven parts of carbonic acid (the basis of the following calculation) is bad enough. The quantity of this gas is one hundred times greater in breathed air

than in the atmosphere. In five hours' time the breathing of one person will add the additional three parts of carbonic acid to the four parts already existing in the atmosphere and thus vitiate ten thousand cubic feet of air. It will be perceived that this is four or five times the cubic space of an average sized-living room. It is not unusual to find present in homes, churches, and school-rooms, and particularly in sleeping-rooms, from fifteen to twenty and even more parts of carbonic acid in every ten thousand parts of air, and yet with occupants entirely unconscious of such dangerous condition of affairs. People, becoming more cleanly every day, would consider themselves defiled if their hands should touch the filth, effluvia, and foul decomposing organic matter that, without stint or hesitancy, they daily drink into the lungs. As in five hours' time one person's breathing will vitiate ten thousand cubic feet of air, it is apparent that means for admission of pure air should be sufficient to supply each person in the room with two thousand cubic feet per hour. This introduction of pure air necessitates room being made by removal of corresponding amount of air already within, and ventilation is the result.

Reference has already been made to the old-fashioned fireplace. It is to be regretted that this is now a thing of the past. Think of the comfort and pleasure we have all experienced in front of its ruddy glow! It is true the heating was unequal and expensive, only about twelve per cent of the heat being utilized; but there were ventilation and health. It is estimated that a common modern chimney will remove per hour five times the amount of air in an average sized room, which would be sufficient to furnish two thousand cubic feet of air per hour for every person occupying floor space four by five feet. An ordinary gas-jet placed in a flue will move three thousand cubic feet per hour. Think, then, of the free, the full, and the capacious breathing of one of the grand old fireplaces we early knew! Think how it roared and threw with a hurl the breathed air up and out of the chimney. No wonder the back felt cold from the rush of air to the chimney-place, and how much we enjoyed the conscious breathing of the lungs! No wonder, also, that consumption was then a thing comparatively unknown. A short time ago the writer

with a large party visited the country-seat of one of nature's noblemen. In one room was a modern stove, and the air, from the persons there gathered, was thick, heavy, and stifling. In another room, crowded with people, the air was clear and exhilarating, as of the mountains, yet comfortably warm—all because of the old-fashioned fireplace.

Another case. A few weeks ago an invalid accustomed to the open fireplace was removed to a house heated by stoves. Rapid break-down was the immediate result, and in a few days there seemed to be months of decline. The thought occurs that the fire which is of utility to the invalid is certainly safe for the strong and healthy.

But they say we have passed the day of the old-fashioned fireplace, and that it cannot return because of its economic features; and yet I for one feel like dropping a tear over its departure.

This paper, however, must have to do with modern methods of heating and ventilation. I speak of heating and ventilating together, and in such order, because the one is the natural cause producing the other as the natural result. The most economical method of ventilation is certainly by use of the ascending currents produced by expansion from heat; and, hence, such method is properly called the natural method, which must forever appeal to all science as the correct method. Now, to my mind there is no plan or method for warming the air of our houses and securing resultant ventilation comparable with that possible by use of the properly constructed warm-air furnace; but as such method is not attainable by the poorer classes, we will begin our discussion by considering the common and lesser means.

The old fireplace with its capacious chimney gave place to the stove for purely economic reasons. At first this was not so bad, for the old-time stove was full of cracks and had a wide mouth, affording by its very defects considerable ventilation. As wealth increased our buildings grew tighter from better workmanship and material, and particularly from paper and paint. The roar of the air through the stove-damper, as the natural means of ventilation struggled with its work of doing good under encroaching difficulties, attracted attention; and soon improvement and evolution gave us the modern

stove, which bases its chief claim to superiority upon the fact that it will burn well while perfectly air-tight. The result has been apparently satisfactory, for there has been a saving in dollars and cents; but it should be remembered that the saving has been in two kinds of oxidation or combustion—the one, in the stove, to the credit of the pocketbook; the other, in the lungs, at the expense of the general health.

However, the stove, and particularly the air-tight one, has come to stay, and provision must be made in home architecture for other removal of the impure air. The chimney must still be utilized; and this can be done by ventilating flues so placed that the heat from the smoke flue will produce sufficient suction to remove the air by connecting ducts and through registers in the floor in remote parts of the room. There must also be ample provision for the admittance of air from without, which should be where it can be immediately warmed and preferably within the jacket of the stove itself. This method of heating and ventilating, however, cannot be very popular, for larger stoves must be the result. It obviously will require more surface and fuel to warm moving and changing air than that which is stagnant. The difficulties from stove-heating are not so apparent to those who are much of the time out-of-doors and away from rooms so heated; but to those who occupy them twenty-four hours out of the twenty-five, think of the air lifeless from overheated iron surface, the impure breathings, the vitiated blood, the pale cheeks, the abnormal action of organs, the headache and other aches—and all without the victim knowing why so afflicted. An investigation by the writer, a few years since, of several fairly good school-rooms, but heated by stoves, revealed the fact that more than eighty per cent of the children were suffering from headache. A year ago while a new school-house was building, two schools held session in wigwam buildings, the walls, floor, and roof being a single thickness of pine boards, with many a crack and knot-hole open to the wind. The temporary accommodation of the fall was from necessity continued through the excessively cold winter of 1886–87; but, strange as it may seem, although great difficulty was experienced in keeping the rooms warm, the general health of the pupils was exceptionally good, and the customary headache incident to most teachers was almost unknown.

But we are considering the question just now as it relates to the home. In view of the many adverse experiences with the heating stove it is not strange that there has been a marked tendency to get back to the open fire by introduction of the coal grate. The ascending heat from a single grate, if properly placed, is sufficient to ventilate a space of ten thousand cubic feet, which is equivalent to a room twelve feet high, twenty-six feet wide, and thirty-two feet long (Washington scale), and that, too, as full of persons as would be the case in an ordinary school-room. With an ordinary-sized living-room, properly shaped, and a grate well built, such a fire can be comfortable and certainly is healthful. The grate fire, then, cannot be too heartily commended. As I have intimated before, the fire which has been found by physicians to be a good thing for the invalid surely must be a safe one for the strong. It occurs to me that a good grate in the school-room of higher grades, in addition to the other means of heating, for this and other reasons, would be a most excellent thing. With sanitary approval it should be noted that there is now coming to the front a very good form of heater combining the good features of the stove and the open fire.

So much for the common and lesser means of heating and ventilation. There yet remain to be considered the two major methods—namely, the *steam-heater* and the *furnace*, or, as it should be more properly called, the *air-warmer*.

I cannot regard the first of these with great favor. It may do very well for hotels, factories, and certain class buildings; but for general purposes the steam-heater is objectionable. I know it is very popular with architects on account of the economy of room, and with others because of its convenience; but I do not like it, because with it heating and ventilating are two separate and disconnected things. It is almost always put in without any provision whatever for ventilation; and where there is attempt at ventilation it is by mechanical contrivances which are necessarily too expensive and inconvenient for general use.

For this reason, and also because of others arising from personal experience, my vote is first and all the time for the properly constructed *warm-air furnace*. Now, by furnace I do not mean a stove placed in the basement and heated red-hot

in order to warm the building; but a great, big, smiling and good-natured iron monster, with avoirdupois enough to hold a constant temperature, and lungs and windpipe sufficiently capacious to keep the building comfortable in all its parts by a perfect flood of air moderately warmed and of normal condition. The great points of superiority in the properly constructed air-warmer, or furnace, as it is generally called, are:

1. It takes its supply of air from without.

2. The air is warmed before it enters the room, and consequently before it comes in contact with the person.

3. It keeps the temperature even throughout different parts of the room.

4. The vital elements of the air are not removed by contact with overheated surfaces.

5. It is economical. There is no waste of heat by conversion into mechanical energy. Nine tenths of the heat in fuel is utilized; while in the case of steam, the fraction is only three fifths.

6. The ventilation is self-acting, stratification of air is impossible, and all impurities are alike removed.

This paper is to be followed by another from the brain of one so eminent as a successful engineer in the heating and ventilating of buildings that I will not go into details.* Sufficient it is for me to say that the best furnace in the world will not ventilate, or even heat well, without proper arrangements for handling and moving the air. The foul air should be removed at the floor, and preferably at different parts of the room. Air-tight ventilating ducts, or space beneath the floor, should carry the impure air to the capacious ventilating shaft, where the otherwise waste heat of the smoke-stack is utilized in producing a powerful upward suction that rapidly removes the air previously within the room and invites the coming of pure air over the furnace and from without. Such a system ventilates, not by the struggle of the furnace to force air into the room, but because of the powerful suction in the ventilating shaft, which keeps constantly moving through the building a flood of life-supporting air, the same having passed over the furnace in entering the building.

* "How Far has the Science of Ventilation Advanced?" By Isaac D. Smead. THE SANITARIAN for March, 1888.

It is astonishing how much ignorance there is as to proper methods of ventilation, or even as to ventilation at all. There is practically no excuse whatever for the foul condition of the most of our school-houses, churches, and public buildings. Sometimes, in a church, for instance, a hole is cut in the ceiling to let out everything but the carbonic acid and to stratify the air ; frequently a window or door adds its dangerous draught and cools without purifying ; but too often the bad accumulations of weeks are held within to make one fully appreciate by contrast the purity of the outer world.

A short time since I went to a new church to enjoy the benefits of a new and improved system of ventilation. They called it "continuous ventilation." The foul air was taken out by a large duct, returned to the furnace, reheated, and its filth decomposed and thus represented again and again as if for "hogs to wallow in their own mire." This was "continuous ventilation" with a vengeance. The devil himself could not construct a more fiendish plan.

I have been in churches where provisions for ventilation were absolutely nothing, where the accumulations of carbonic acid were so great that even the lamps would grow dim and almost refuse to burn, and yet the poor soul was expected to be in a healthy and vigorous condition, to "awake to joyful lays," when "as the hart pants" would be a more appropriate theme. In other classes of buildings there is also a like lack of proper provisions for pure air. Oh for a happier enlightenment and dissemination of knowledge, when we shall better know the possibilities within us and the principles upon which our physical, intellectual, and even spiritual vigor is conditioned. How long shall ignorance in this respect reign so universal and supreme? Surely this one important topic of sanitation demands our help and encouragement. We stand within our homes and places of occupancy with floating death impregnating the air we breathe, with the effluvia of our bodies and the decomposition of our breath returning again as that upon which we must feed. Without are inexhaustible supplies of pure, fresh, and exhilarating air, the freest of all of God's material blessings, the one thing above all others in which there can be no monopoly, obtainable at appropriation, the supporter of existence, the oxygen, the life. Let us open the doors and bid the good angel, "Enter."

MEAT-POISONING.

By JOHN A. CHESNEY, M.D., Bucyrus.

IT has long been known that meats of all kinds were poisonous under certain circumstances and conditions, not until lately well understood. For the last hundred years medical literature teems with reports of instances of meat poisoning, some of these reports being absolutely appalling in the amount of suffering and loss of human life believed to have been so caused, and without offering one word in explanation of the cause other than venturing the surmise that the beast was diseased when killed or the meat was decomposed.

Perhaps from the earliest ages to the present time meat poisons of various kinds have been dealing death freely and indiscriminately to our kind without their existence being suspected until within the past few years.

A little over fifty years ago our entire knowledge of this important subject consisted in a knowledge of the fact that animals which suffered from certain contagious and sporadic diseases, such as pleuro-pneumonia, foot and mouth disease, rinderpest, malignant pustule, and dropsical affections of heart or kidney origin were unfit for consumption, and that decomposed or putrid meat acted often as an irritant poison.

As lately as 1832 trichinæ-spiralis were discovered in pork, and this discovery has resulted in avoiding a world of human suffering and saving many valuable lives. The remedy is pointed out, and trichinosis should now be a thing of the past.

In 1844 the discovery was made that the human subject contracted tænia from the meat he consumed. Here also the remedy is plain, and has resulted in great benefit to the race.

It has also been demonstrated that canned meat is often poisonous, not only from the lead used in soldering, but from the tin itself, and that, too, of tin of good quality. That hams become contaminated from the coloring matter of the sacking in which they are contained. Many more sources of contamination might be enumerated.

But it is only very recently that we have begun to understand the most virulent, the most common, and the most fatal of all meat poisons—the poisonous alkaloids or ptomains contained in meat under certain circumstances.

It has long been known that decomposed meat was poisonous, but this knowledge was too indefinite to be of much practical utility to the sanitarian or toxicologist.

It is only of late years that it has become known that a short time after the death of an animal there may develop in the body certain poisonous and non-poisonous alkaloids, the chemical and physiological action of which resembles that of the poisonous vegetable alkaloids.

As early as 1853 Schlossbarger made a discovery of organic substances in the products of decomposition. Then Marquard separated a base; but it remained for Selmi, an Italian, to discover these alkaloids, separate them, name them ptomains, and give their chemical and physiological actions. This was in the period from 1870 to 1877, and since that time new discoveries have been continually made, their nature and properties have been more closely studied, until we seem to have obtained a fair knowledge of them. But developments in private practice continually remind us that we are far from being accurately informed as to the circumstances of their formation, and it is the object of this paper to offer an addition to our knowledge upon this branch of the subject, by relating a few cases that have occurred in the writer's practice, and which seem to offer some rather surprising features.

At 5.30, on the evening of November 1st, 1886, I was called to see Mrs. K——, who had been suddenly taken violently ill. While apparently in her usual health, she had been suddenly seized with intense pain in the abdomen, and extreme nausea, from which she fainted, and was just recovered from the fainting fit when I arrived. I found her retching and vomiting, bowels moving every few minutes, and suffering from intense pain in the abdomen. Pulse 120, and at times almost imperceptible; pupils slightly dilated, skin pale and moist, with profuse perspiration, intense thirst and a feeling of constriction about fauces. She complained of intense pain in frontal region, of cold hands and feet, and cramping of long muscles of extremities. She first vomited contents of stomach, con-

taining a quantity of meat entirely undigested, and emesis continued throughout the entire night, the vomited matter consisting chiefly of mucus. The bowels also continued to move occasionally and were irritable and painful during the entire night. These symptoms all continued with less violence until next morning, when they gradually were controlled, leaving her weak and prostrated, temperature remaining normal.

In perhaps fifteen minutes after my arrival, and while busily employed restoring Mrs. K——, a nephew about five years of age became suddenly sick with exactly the same symptoms, except that his condition did not approach that of collapse so closely as did that of Mrs. K——, vomiting, purging, and abdominal pain being the most prominent symptoms, and these yielding to treatment much more promptly. Pulse was accelerated and weakened, pupils remained nearly normal in size, frontal headache not so severe, and perspiration not so profuse ; emesis as violent, but bowel disturbance not so marked, and no cramping of extremities ; temperature also remained normal.

The husband, who had been hastily summoned from his office, reached home at about the time of my arrival at his wife's bedside. He had been attending to his customary duties during the afternoon, and had not noticed but that he was as well as usual. A few minutes after the nephew was taken sick Mr. K—— retired to the water-closet, where he also was taken violently ill in the same manner and fainted. He was assisted to bed, and immediately developed the same symptoms as those of his wife and nephew, but greatly intensified. Emesis was violent and almost constant, and bowels moved continually ; abdominal pain was intense. He passed almost immediately into a state of semi-collapse. Pulse became 130 to 140, and exceedingly weak, skin cold, pale, and bathed in profuse perspiration ; pupils largely dilated, extremities cold, and cramping of all the muscles of extremities ; intense thirst and constriction of throat ; voice became hoarse or husky, and suffering from intense pain in frontal region ; temperature 97°. As was the case with Mrs. K—— and the nephew, the first matter vomited consisted largely of undigested meat.

Under the free administration of opiates and stimulants

hypodermically, the symptoms of all gradually subsided somewhat, but continued with less intensity throughout the night.

The boy, recovering soonest, was up next day. His tongue was red, stomach somewhat painful and irritable, and he was weak and dizzy, with no appetite. Mrs. K——'s condition next day was not so good. Head ached, tongue was red, stomach painful and irritable, but retained small quantities of lime-water and milk. She continued to improve, being entirely recovered in five or six days. Mr. K—— was in much the same condition, except weaker. His stomach regained its tone more rapidly, however, and he had regained his customary health in a week.

Suspecting that some irritant poison had been ingested, perhaps, with the food, a thorough inspection of the larder and cooking utensils was made, but nothing suspicious was discovered. They had used no new cooking utensils, and no new article of diet had been purchased except a small veal steak, which they had eaten for dinner. The servant girl had eaten none of the veal, but had eaten of all the other dishes upon the table. It was then discovered that they were sick exactly in proportion to the amount of veal consumed, the servant girl being exempt. This was satisfactory evidence that the veal was in some manner poisonous. A specimen of the meat could not be secured, as it had all been consumed, and the ejecta of the patients had been disposed of by the nurses. I then purchased specimens of the veal at the butcher's, satisfying myself that he had only the one veal in the shop, and examined it microscopically without detecting anything abnormal. The usual tests for fermentation and decomposition were also applied without showing anything wrong. A list of customers who had purchased veal at the shop during that day was procured, and it was discovered that they had all partaken of it with no bad results. I also ate of it myself, and found it to be wholesome. The history of those particular pieces which had been sold to Mr. K—— was then traced closely, with the following result :

The calf was eight weeks old when killed, and was, so far as known, in good health. It was butchered at 6 P.M. Saturday, brought to the shop, and allowed to hang for four hours in the open air to cool, and was then placed in the cooler or ice-box,

where it remained until Monday morning. Monday morning, after selling some veal from a hind-quarter, two steaks were cut off and laid upon the marble slab to await a customer. This was between 9 and 10 A.M. At 12 noon Mr. K—— bought these two steaks which had lain there for perhaps two and one half hours, and took them home, where they were immediately fried well done, and at 12.30 all ate of them except the servant girl. The man who purchased the first steak off this quarter was not affected by it, nor were those who ate the succeeding steaks. It then became clear that these pieces of veal became contaminated during the time they were exposed upon the counter, or during a period of from two to three hours. It was impossible to discover any possible means by which they could have been contaminated by outside influences, and as the toxic effects were in exact accord with those of one of the ptomains, we are forced to the conclusion that the poisonous effects were produced by that alkaloid of fermented meat which resembles atropine and hyosin in its effects.

The first point to which I wish to draw your attention is the short time this meat was placed under conditions favorable to the formation of poisonous alkaloids, by fermentation or putrefaction. It was exposed Saturday evening while cooling to a temperature of about 50° for four hours. It was then placed in the ice-box, the temperature of which, when well filled, is about 40°, where it remained until Monday morning, when it was again exposed from 9 or 10 A.M. to 12 noon, or about two and one half hours, to a temperature of nearly 60°, the maximum temperature for that twenty-four hours being 66° and the minimum temperature 44°. This is a much shorter time than that given by any of the experimenters upon the subject of the formation of the poisonous alkaloids, and the circumstances were decidedly unfavorable to their development.

I wish also to direct your attention to the promptness with which the symptoms made their appearance in each case—the first in five hours, the second in five and one quarter hours, and the third in five and one half hours. It would thus appear that the ptomain, which resembles atropine in its toxic effects, has a period of incubation of five to five and one half hours, that it

is among the first poisonous alkaloids produced, and that it is developed under certain circumstances in meat that would be considered far from putrid or decomposed, and is, perhaps, rather a product of fermentation than putrefaction.

J. U. BARNHILL, A.M., M.D. (Lecturer on Toxicology, Columbus Medical College, Columbus), added, with regard to this subject, that at the last annual meeting of this Association he presented a paper on "Ptomains and Meat Poisoning," in which he reviewed at some length the history and chemistry of these interesting products of decomposition, and reported over a hundred and fifty cases of meat poisoning, besides many cases of poisoning from cheese and ice-cream. It may now be safely assumed (he said) that the symptoms of poisoning from canned beef, dried beef, and sausages, cheese, and other putrid albuminous substances, is due to cadaveric alkaloids. Experimenters are still busy at work in this new field of inquiry, and new ptomains are being added to the list. It would be consuming too much time to even give the names and sources and toxicology of the ptomains that have been discovered recently. The literature on the subject is mostly concerned in their chemistry, physiological and toxic action, and in their relation to bacteria and the phenomena of disease.

In these relations they are of more interest to the analytical chemist and pathologist than to the sanitarian.

In a criminal case against an Italian servant for poisoning his master, an expert reported that delphinine was the source of poisoning, and Francesco Selmi saved the defendant from unjust conviction by proving that a putrefactive alkaloid was the cause of death. Other cases of similar character are on record.

Meat poisoning, or botulismus, has always been most frequent in those countries in which large quantities of prepared meats are used. In the Swabian districts of Germany, where smoked sausages are staple articles of food, this form of poisoning has been comparatively frequent.

In our own country poisoning is comparatively rare. Only two or three cases in Ohio have been reported to the secretary of the State Board of Health within the year, and these were of so little importance that the parties did not furnish particu-

lars nor aid in investigations. The cases of cheese poisoning at Akron, which occurred recently, are now under investigation by the State Board of Health. They were doubtless produced by tyrotoxicon, the putrefactive alkaloid discovered by Professor Vaughan. At Thorn Grove, Ky., in last July and August, a "fatal epidemic prevailed" among the families who used water from a certain spring. Several deaths resulted, and upon investigation it was found that the source of the spring had been "polluted and poisoned" by the decomposition of a number of dogs that had been killed and thrown into a cave through which the main stream of the spring flowed. "Some time after the community had quit using the water from the spring a traveller drank of the water, and in a few minutes was made deathly sick." This is a good illustration of the large quantity and virulence of the cadaveric alkaloids that may be elaborated in decomposition, as well as of the vigilance that should be used in maintaining the purity of drinking waters.

The practical question for us to consider as sanitarians is, how can *poisoning* from decomposed foods be prevented? We are to look for its prevention in the same line of effort that has been put forth by this Association since its organization—viz., the education of public opinion on questions of public health, and the establishment and encouragement of boards of health. It is to the honor of this Association that it stands *loco parentis* to the State Board of Health.

It was through its efforts, and the untiring efforts of some of its most active members, that that board was established. It is through these agencies—educated public opinion and efficient boards of health—that we are to look for a diminution of the amount of unwholesome foods, and consequently in the diminution of the number of cases of meat poisoning. These questions must be pressed upon the attention of the public, until individuals shall be more careful in their purchases and better able to detect unwholesome foods; more exacting of dealers in requiring them to supply only wholesome articles, until unscrupulous dealers shall know that it is unsafe to offer for sale spoiled meats, and until public opinion shall be so exacting that boards of health shall be compelled to do their whole duty, and courts shall mete out the severest penalties to offenders.

What has been done in this line by boards of health throughout the State in protecting innocent purchasers, may be inferred from what has been done in given localities. In the eight months ending January 1st, 1888, the Board of Health of Columbus condemned 15,639 pounds of spoiled meat, besides large quantities of fruits and cheese. It authorized the arrest of nine dealers for handling decomposed meats, all of whom were convicted and fined. When we realize how virulent are the ptomains developed in decomposing animal matter, and that spoiled meats are not always easily detected by the unwary or ignorant, we readily understand the valuable service that has been done for the community in withholding these eight tons of poisonous food from the mouths of consumers. The ptomains generated in one egg (reported a year ago) killed one person and made two others very sick. The ptomains dissolved out of the putrescent mass of dead dogs at Thorn Grove was sufficient to render the water in a spring a considerable distance away fatally poisonous for several weeks. One milligramme of an oily ptomain, extracted by Gautier, killed a bird very suddenly. When the public come to understand that such virulent poisons are generated in putrid foods even in dangerous quantities in the very beginning of decomposition, they will be more wary in their purchases, more exacting of their dealers, and more helpful to local boards of health.

VILLAGE BOARDS OF HEALTH.

By Austin Hutt, M.D., Waverly.

It is not the object of this paper to enter into a lengthy discussion of the imperfect sanitary condition of villages, or give a detailed account of the various methods that have, from time to time, been advocated by eminent sanitarians, for a better and more perfect system than has heretofore existed. As a resident of a village, and in behalf of all others in this State, I would direct attention to the negligence and carelessness resulting from the present mode of establishing local boards of health, and urge the necessity of, and recommend

such changes in the law as will give to each incorporated village a health organization.

We talk and read of diseases that are preventable, and formulate plans to protect the people from their ravages; yet year after year the same diseases prevail, and people wonder why Providence has withdrawn divine favor and selected their town for His visitations. If they will walk along their streets, or saunter through the alleys, or pause before the privy vault, stable, hog-pen, or garbage pile, and think of the source of their water supply, evidence before them is as convincing as the accumulated filth is convicting that the people themselves are responsible for preventable sickness. It is due to the carelessness of those inhabitants who furnish and perpetuate the proper nidus for the development of preventable disease; because accumulations of filth are the hot-beds where the germs of disease are bred and nourished, and the people, with their habits of living and methods of disposing of waste products, have, from time immemorial, exercised the right and enjoyed the privilege of being their own health-keepers; how injudiciously this right has been exercised is an "oft-told tale." We have only to enter the confines of any village without a duly organized health service to find that which is too unsightly to remain on the surface; and, not content with polluting the atmosphere with the odors of decomposing animal and vegetable waste scattered over the surface, they construct pockets, and fill them with human excreta, to leach their liquid contents into the nearest water supplies, and their gaseous emanations through the soil into their dwellings. *This* is "sanitation" without health service.

The public health is of as much importance to the village as it is to the city; and for this reason local boards of health should be established to furnish a more systematic education of the people and for the enforcement of sanitary laws.

In the largest cities the board of police commissioners or board of control are the guardians of the public health; in villages the council may act in the same capacity. The former by express statute are required to "exercise all the powers and perform all the duties of boards of health;" in the latter it remains optional whether a board of health shall be established at all!

Villages should have the same protection from the ravages of epidemics as cities, and the power that is given the council should be utilized unreservedly, and ample protection should be afforded to the citizens of every village in the State.

When a village council establishes a board of health, the selection and appointment of six persons, to constitute said board, should be made with due honor to the position ; none but competent men should be selected for the position—those who think and feel that they are not only the guardians of the health of the community, but possessed of sufficient energy to enforce all laws pertaining to the office.

To have a board of health efficient and active its members need not be all physicians, but men of different vocations, who have an interest in the welfare of the people.

Before the board enters upon its duties as such, the council should, by ordinance, "grant power to said board to make such orders and regulations as it may deem necessary for the public health and prevention of disease," in accordance with the statute for the purpose of systematizing the work for each and every locality in co-operation with the State Board of Health.

A health officer is an indispensable part of the board of health in every community. In small places there appears to be no serious objection why one of the members of the board should not act in that capacity. However, this would make his duties, in the double capacity, more arduous, and for this reason, perhaps, it is better that he should be an independent appointee by the council.

The board being organized and equipped, it should proceed to inquire into the sanitary condition of the village, and afford protection to its inhabitants. The board should use due diligence to acquire a thorough knowledge of the causes of disease in their midst ; regulate the disposal of garbage and kitchen slops ; the construction, emptying, and cleaning of privy vaults, water-closets, and cesspools ; drainage and sewerage ; the proper construction and care of slaughter-houses, hog-pens, and cattle-pens ; in short, everything that is liable to give rise to disease. Water supplies should be investigated, and any contamination or pollution of such should be speedily regulated by the prompt removal of all agents that tend to

render the water impure and unwholesome. If the sources of such impurities cannot be discovered, or the causes that are productive of the same cannot be removed, then it would be the part of wisdom to abandon such supplies and seek another source of supply. Dairies should be inspected and milk analyzed, and the selling of adulterated foods prohibited.

Under the present law, if a board be successful in the performance of its duty to the public, it must have the earnest co-operation of a liberal and generous council; without this anything the board would desire to accomplish would often fall short of the desired object.

When complaint is made to the board it should be direct to the health officer, whose duty it is to repair to the place or object of complaint and make a thorough investigation and report to the board. But if from the nature of the complaint it requires no action by the board, as in many instances it may not, a notice from the health officer will suffice. The board should act promptly upon all complaints brought before it. If in the judgment of the board the subject of complaint is a public nuisance, or is "dangerous to life and health," a resolution should be adopted ordering the same to be abated.

Were all orders and resolutions of the board promptly obeyed, it would be unnecessary to proceed further; but it frequently encounters an unpleasant resistance, and each member is abused and vilified for enforcing the law. This is discouraging, and resignations have resulted from it. If a person of whom complaint has been made belongs to the poor class, such person, more through fear of the law than pride in sanitation, will obey orders.

If a large corporation, or those who abound in wealth and luxury, are made the recipients of a visit, together with a resolution of the board that a nuisance exists on their premises, and must be abated, they will often bid defiance to law and resort to every available scheme to delay and frustrate its action; public sentiment is finally interested in their behalf, and erelong the board of health is denounced and stigmatized as the greatest nuisance in the village, and the council may be solicited to abolish it.

Changes occur in the council, either by resignation or expiration of term, and by the election or appointment of a number

of new members may prove detrimental to the board; for an incoming council, with all due respect to the health organization, and a full knowledge of its mission, but unappreciative of its benefits, frequently determine that the expense incurred for its support is too great, and an overburdened, tax-paying people demand retrenchment in all municipal affairs, which means the board of health must go. By so doing a personal grievance has been appeased, and a few dollars less taxes collected. Such a method of practising economy may wreck the business of the community and cause the loss of many lives. Where a village is so fortunate as to have a board of health, it should be the pride of the council and joy of the citizens to have it sustained, although the present need is not manifest.

Every village in this great State of Ohio should without delay have a board of health established. And while this is entirely out of the question under the present law, yet the laws governing the same should be so amended as to *require* the council to establish and maintain such organization. As sanitarians we must agitate this question and keep it prominently before the people. The duties devolving upon health organizations in small communities are by no means pleasant, to say the least, and in this connection the efficiency of a board is often seriously impaired.

Dr. C. O. Probst, Secretary of the Ohio State Board of Health, has kindly furnished me with the names of all the local boards—one hundred and fifteen—reported to him. According to the census of 1880, seventy-four of the number are of villages. But since the last census there has been a rapid increase in population, which makes it possible that some that were then classed as villages now rank as cities; thus the number of villages would be materially diminished. The one hundred and fifteen—cities included—are located in sixty-four different counties, with from one to five boards in a county. From this it is to be inferred that the people throughout the greater part of this State are awakening and begin to realize the necessity of a more perfect sanitary service than has heretofore existed.

A question of vital importance to successful village sanitation is how to overcome the prejudice that exists among the people regarding boards of health. Whether this opposition

arises through ignorance, and is nourished by superstitious ideas, is a subject that requires careful consideration. Whatever the obstacle may be, it should be overcome. With such persons as constitute it no amount of reasoning will have any effect toward convincing them of the utility of boards of health, because with them a "stink is healthful and keeps off sickness;" to remove it from their midst is encroaching upon personal liberty and destroying what protection has been thrown around them for prevention of disease.

Nuisances of a general character are alike applicable to all villages; what exists in one is usually found in the other; and while the professional sanitarian has done much to enlighten the people on this all-important topic by devising methods of abating nuisances and preventing disease, yet his efforts alone will avail nothing unless the people generally unite and follow his teachings. But the people usually are slow to acquire a knowledge of subjects relating to health; and for this reason, if none other, boards of health should be established in each village, to spread information and enforce obedience to such laws as will secure to its citizens freedom from preventable disease.

THE NECESSITY OF A UNIFORM MEANS OF REPORTING TO HEALTH DEPARTMENTS.

By W. J. Scott, A.M., M.D., Professor of Clinical Medicine, Western Reserve University, Cleveland.

The collecting of vital statistics is largely that they may be of service to the living as a means of judging of the effects of disease on man, or on classes of men, in arriving at the etiology of diseases, and in medico-legal investigations in the prevention and detection of crime. In England the Bureau of Vital Statistics has become an important department of the Government. To be of the greatest value, vital statistics should be perfect, or as nearly so as possible. To be made as perfect as possible, there should be a uniform plan for their collection. Unfortunately in this country we have no such

department in the Government. Some of the States have organized boards of health, but no uniform plan for collecting statistics. Many of our cities have such local boards; each one has a plan of its own for collecting such information. These sources of information are so different that it is next to impossible for any person to take these reports and tabulate the statistics on any particular disease, as I have verified to my dissatisfaction. Last summer I commenced to look up the subject of cholera-infantum. I found it impossible to institute any comparisons between different localities, for the reason that some places reported cholera-infantum, and these would have, as I believe, too many cases, by false or bad diagnosis. Others—and these are in the majority—jumble all deaths under five years together and report so many deaths; or all diarrhœal diseases under one head, without distinguishing the different affections. In several of the largest Southern cities the reporters denied that they had such a disease as cholera-infantum. However, on comparing their proportion of deaths under five years, it was as large or larger than ours. On account of these difficulties, I gave up the task as a hopeless undertaking.

On account of the many difficulties in tabulating this class of diseases, this short course has been taken, but it is easy to see that, except to procure the report of the number of deaths, no other knowledge can be obtained from them. I can show imperfections in the reports of some other diseases nearer home; a certain set of reports showed very few zymotic diseases, while the city is known to be in a malarial region. Then it may go without saying that all these reports should be made by physicians, and not by clerks and undertakers and township assessors. This leads to notice our own plan of collecting vital statistics. Our law requires a probate judge to report the marriages from his office to the Secretary of State, and the township assessor births and deaths in his district during the year. Any person who knows anything of the subject knows that such a report will be worthless on account of want of accuracy. The State Board of Health should have charge of this whole subject, and require all reports from State institutions, from all local boards, and county officials; also, they should have power to require town-

ship, or, at any rate, county officials, to organize local boards, to whom reports should be made. Cemeteries should report on death certificates of a physician or health officer; then, and not till then, will the doing be worth anything to the living or posterity.

Death certificates should certify the full name of the decedent, age, place of birth, color, and occupation. Why the occupation? By English reports occupations may be classified, and the longevity of the class determined, which may become a matter of the greatest importance, even in determining public policy, or assisting in deciding the etiology of the diseases of the class. In England clergymen have been found the longest-lived class, then lawyers, physicians next. Classes among the wage-workers suffer according to exposure to unfavorable conditions; stone-cutters, metal-grinders, and metal-polishers, etc., are among the short-lived classes; so that it is a question of public policy whether authorities should not require all such trades to be carried on in such a way as to do the very least damage to the operatives. I want to make another comparison of a large class in these reports. The class who keep gin-shops have a longevity twenty years shorter than the clerical or the lawyer classes. It is not in the nature of the case to suppose that this large number die earlier from any other cause than from their daily habits. These comparisons can only be made after accumulation of accurate data. We have no such collection, and unless we do better in future than we have in the past, we never will have. At the present time I do not desire to notice other and important conditions, affecting the health and pecuniary conditions of their dependants, than the mortality statistics of the class.

To make these statistics available for the study of diseases, the primary and secondary causes should be noted, and put on record in permanent form, so that hereafter we can determine whether diseases are increasing in proportion to the increase of population or not.

The opinion is often expressed that cancerous diseases and mental diseases are increasing in the country more than the proportional increase of population; perhaps this is true in regard to some other diseases. If this is so the fact should be determined, and we would then be in a better condition to study the causes of the increase.

Another subject of interest now, and which will become of greater importance as we become an older people, is the accurate reports of births in such form as that they may be preserved for future reference. In England these statistics are kept by the parish priests, by clergymen of the Church of England, and by preachers of Nonconformist organizations, so perfectly that old people now, who came to this country in youth, can write back and learn any fact in relation to their birth, or of the birth and death of their parents. It is easy to see how important such information may be in deciding judicial questions. In this country all this is and has been suffered to go at loose ends, in a slipshod way; both in a scientific and legal sense the subject is of very great importance in every way. But when the subject has been urged upon the attention of our Legislature, the expense of such an organization has been urged against such measures; and when our Legislature did pass a law to organize a health department, it contained neither teeth nor backbone. Under its operation our statistics will be worth comparatively little, for the reasons which I have given. One of our governors not long ago objected to the organization of another department of the State government, but if a Texas steer had been let loose in the State, with Texas fever or pleuro-pneumonia, the fact would have been trumpeted from Dan to Beersheba, and the power of the State brought into requisition for his arrest. Our present governor has not done much better; he has not called the attention of the Legislature to the glaring imperfections of our law, nor the inefficient results produced by it.

It seems that, with efficient State organizations, if those States which have State Boards of Health would adopt uniform plans for reporting vital statistics, valuable results might be speedily produced. Such reports having been obtained, a Government Bureau in the Department of the Interior would be easily wrought out. Such a bureau should be in charge of a board of health such as we had a few years ago, which did more and better work in a short time than any department of the Government, not only in the interest of health by health measures, but by advising proceedings and policies which resulted in great convenience to the Government, and promoted the maritime interests of the country, as well as of

other nations. By the advice of this board our Government required our consuls in foreign ports to report contagious diseases there, and that vessels sailing from such places should have certified bills of health, perfect or otherwise, and in this way guaranteed accordingly. These reports were valuable as they were accurate, and were means of perfect knowledge, which promoted public and private interests.

To obtain our vital statistics they must be collected at the time of their occurrence; every physician should make his report at the time, in such form as to give the proper information for comparisons. Vital statistical reports should be truthful to be valuable, not, as I have noticed in some reports from cities of 40,000 inhabitants, with mortality report of 6 per 1000 for two weeks. Any person accustomed to scan mortality tables will know that such a report is inaccurate at a glance. If our State only collects a part of the material which the report should include, the whole becomes worthless. Our laws should therefore be so amended as to make it possible to collect all vital statistics. It has only been my purpose to present these points in such a way to the society as to call out discussion here, and awaken interest in the State among physicians.

THE WATER SUPPLY OF TOLEDO.

By Samuel Segur, Esq., Toledo.

THE public water supply of cities is a subject which must ever interest the student of sanitary science, as well as the less thoughtful but equally interested individual, whose time and energies are given to the business cares incident to city life.

If it be granted that "public health is public wealth," then no large community can be counted upon as possessing the sound elements of financial prosperity whose public water supply is of doubtful quality, and therefore liable, instead of aiding mankind to combat and destroy the death-producing germs of filth and disease, to propagate and disseminate them.

Toledo stands high up in the list of well-watered cities, when

abundance of supply and distribution of mains is considered, and at a respectful distance from the foot of the list when quality alone is looked at.

Our fifty-four miles of distribution pipe, located in one hundred and three streets, avenues, and public by-ways, and fed through three miles of thirty-inch main, with a pumping plant capable of supplying, under ordinary conditions, fifteen millions of gallons of water per twenty-four hours, at a pressure of one hundred pounds, if necessary, to the square inch, said supply being drawn from a source as inexhaustible as the Great Lakes themselves, give enduring promise of unremitting supply.

As to quality, the same praise cannot be extended. Half of the time no better water could be desired, but the storms of autumn, the "break-up" of early spring, and the rains of early summer all bring turbulence to our river, dissatisfaction to our consumers, and overloaded adjectives to the ears of our water-works officials.

The clay country, which extends around us in all directions, and drains its soil-stained rainfall into the tributaries of the Maumee, as well as the rich mould of the "Black Swamp," brought hither through the medium of "Wood County ditches," unite to give our water supply, on the occasions above enumerated, that unsightly but not especially deleterious character, which is the chief complaint with which heretofore we have had to deal.

Although at such times not a thing of beauty to look upon, it is, nevertheless, a wholesome, healthful beverage, containing, as shown by the analysis of Professor Charles F. Chandler, of New York, less than three tenths of one grain of organic matter to the gallon, no trace either of albuminoid or free ammonia, and a total of solids to the gallon amounting to about six and one half grains, half of which is carbonate of lime.

One other source of contamination has been recently forced upon our notice, upon the magnitude of which we are as yet unable to speak authoritatively.

A sudden rise in the river brought down with the flood the unmistakable odor of crude oil, which continued for a period of three days, and gradually passed away, proving the well-

grounded fears expressed during the early development of the Northwestern Ohio oil-fields. And here, indeed, may come in the most difficult problem of all in solving the much-considered improvement of our water supply.

Crude oil afloat in the Lower Maumee during any great portion of the year must evidently render its waters useless for domestic purposes, and along with them the near waters of Lake Erie as well; but, with present light on the subject, I am of the opinion that our river can be thus contaminated only during those occasional periods when the country to the southwest of our city is partially overflowed, and the excessive drainage therefrom brings with it the waste oil of that region, greater now, doubtless, than it will be in the future, when a more general use of that commodity as fuel will make it too valuable to be wasted as it has been. Add to this probability the undeniable fact that for full six months out of the twelve no drainage of any consequence reaches that portion of the river below the rapids, and an indication of the proper remedy is disclosed—namely, the use of storage reservoirs large enough to furnish our supply during a period of from four to six months' duration.

A system of basins, located on ground high enough to afford easy drainage during the process of cleansing, which would doubtless be necessary at intervals, and furnished with a supply either by gravity from above Providence Dam, or by low-service machinery of large capacity from the river near, would, it is believed, place the city in a position as regards its water supply which no other system of equal or less cost will do.

Other plans for the clarification of public water supplies have from time to time come into notice, prominent among them being various systems of filtration.

I think that the general (almost universal) experience, both in America and Europe, has been one of failure with the older systems of filtration, unless the water was first thoroughly clarified of suspended earthy matters by subsidence.

Certain it is that the attempt made on Maumee water so resulted fourteen years since, and subsequent tests with small filters have confirmed the judgment above expressed.

Of the new systems of filtration—*i.e.*, those in which the filtering material can be readily and often cleansed of collected

impurities, the "Hyatt Pure-Water System" demands notice, from the fact that Mr. Hyatt not only claims for it the ability to successfully handle large public supplies, but has demonstrated that ability with some varieties of water to a greater or less degree.

His system consists in first treating the water with a strong solution of alum, then filtering rapidly, under pressure, through a mixture of pulverized coke and fine sharp sand, contained in an upright sheet-iron cylinder, which is divided horizontally by means of an iron head into two compartments of about equal capacity. The head is pierced by one or more valves, through which the filtering material passes, after being cleansed, to its bed in the lower half of the cylinder where the filtering is done; and the mixture of finely-ground coke and sand, when it has become foul from collected impurities, is drawn from its bed and deposited upon the head by means of a reverse current of water, where it undergoes a more or less thorough cleansing by means of a strong current of unfiltered water, the excess of which, with the larger portion of the deposited filth, is carried away through an overflow near the top of the cylinder.

Following the cleansing process the reverse current is turned off and the filtering material again allowed to drop back to its proper place through the valves above spoken of.

The amount of alum used varies with the character and quality of the water; the operator of a Hyatt plant in this State informed me that he used as little as six tenths of one grain, and as much as a grain and three quarters to the gallon during the different seasons of the year.

The apparent expense in operating a plant handling millions of gallons a day, is, in my judgment, the most serious obstacle which this system presents, although the use of alum, necessitated by the rapid filtration, which must without its use fall far short of rendering the water clear, would by some be considered an additional objection, both on account of the resulting hardness and the astringent character imparted to the water. I am aware that the objections here raised conflict decidedly with the claims and arguments offered in support of the system, and I offer them only as relating to the subject of this paper, "The Water Supply of Toledo," and as experience here has demonstrated the facts to be.

It may have been noticed that in considering the improvement of our water supply, no reference has been made to Lake Erie as the future source of pure water for Toledo. My reasons for not doing so are manifold.

The western end of the lake is shallow, and the general formation of its bottom clay, with a sparse deposit of gravel and sand.

Between this city and its nearest limits stretch twelve miles of muddy sewage-polluted river and bay, and between the present terminus of our thirty-inch main (Cherry Street), and the nearest safe point for taking water from the lake, stretch not less than fifteen miles.

At this point the depth of water will not exceed at its average stage eighteen feet, at which depth it is obvious that during storms the entire body of water must be affected from the action of the waves upon the clay and gravel of the bottom, and where without doubt any natural oil coming down the river must affect for the time being the purity of the water supply.

Finally, fifteen miles of large water main, mostly submarine, will cost not less than one and a half millions of dollars, a sum exceeding the entire disbursements, including the running expenses, of our works since their construction, and nearly equalling one half of the present city debt. It is therefore apparently useless to seriously consider any plan looking to Lake Erie for a supply of clear and pure water; and, without doubt, the only feasible plan for attaining that very desirable result will eventually be what is here recommended—viz., large storage reservoirs, whose supply can be taken from the river during the time of its best condition, and where, after being so taken and stored, a further clarification may take place by subsidence.

In closing this paper I wish to express the hope that this Association will continue its investigations into the problem of public water supply.

Nothing is of greater importance to the healthfulness of cities or to the health and happiness of the human race.

CHOLERA: ITS PREVENTION AND LIMITATION.

By D. H. Beckwith, M.D., Member of Ohio State Board of Health, Cleveland.

PROBABLY no subject now before the general public will receive greater attention within the next few months than the threatened invasion of Asiatic cholera. Its advance into Europe from India, its birthplace and stronghold, has already been heralded, and the terrible scenes incident to its former visitations have been re-enacted, to some extent, in many of the localities upon which it has set its death seal. The broad field of speculative research which its history affords has furnished no remedial agents with sufficient potency to conquer the disease itself, but there have been noted several of its characteristics, which, intelligently interpreted, furnish suggestions to the sanitarian as to the most effective measures for preventing its primary advent, or, failing in that, of checking its progress beyond certain limits; and with these questions we would deal while yet we have the shadow of the disease only, not its substance.

To attempt even a summary of all the theories which have from time to time been formulated, or to trace its history from its earliest exportation from India through all the intricacies of commercial intercourse with that country, would be a work of supererogation. We would rather briefly set forth some of the most prominent characteristics of the disease itself and its propagation under certain conditions, and make such logical deductions therefrom as may prove of wide applicability with a view to the prevention, or limitation, of future outbreaks through the medium of practical sanitation.

No authentic case of Asiatic cholera has ever made its appearance in places beyond its endemic area except through direct contact with the disease itself, or with its active principles in specific forms. No crowding in tenements or communities, even under the most baleful conditions, has ever been productive of this disease—a fact which involves problems in sanitation, the solution of which has been attempted

in various countries by quarantining ports of entry and establishing cordons of police and soldiery about inland districts. Blockades and boycotts, however, as at present established, are not always effective; so to these problems must be added a corollary—the best means of limiting its ravages after its invasion.

The question of excluding the disease from our shores naturally takes precedence over the means of preventing its spread after its importation. There is but one solution to this most important problem—an effective quarantine against every medium through which the choleraic poison may be introduced.

The various outbreaks in this country since 1832 show conclusively that existing quarantine regulations are inadequate. It is true that vessels are detained and inspections made of passengers and their effects, but the inspections rarely extend beyond the steerage, and seldom, if ever, include baggage packed before embarkation, or the dunnage of ships' crews. Nor will the most careful examination of baggage reveal the poison which may be preserved indefinitely through dejecta dried during the period of activity, and which may be carried hundreds of miles inland before being liberated through changed conditions. Instance the many cases of the appearance of the disease in seaport towns among washerwomen who have received the soiled garments and bedding of sailors and immigrants from infected districts for renovation, and of the many outbreaks on shipboard when hundreds of miles at sea. Notably, the case of the ship New York, which sailed from Havre, November 9th, 1848, with three hundred and fifteen steerage passengers on board. There was not only no cholera at Havre, but none in the whole of France, yet on the seventeenth day out it made its appearance among the passengers of this vessel. The preceding day had been damp and chilly, we are told, and the passengers overhauled their baggage to secure warmer clothing. Among those on board was a German who had brought out articles of clothing belonging to a relative who had died of cholera some time before. The day of the outbreak proved hot and sultry, and the appearance of the disease followed the exposure of the infected moist garments to the heat of the close and crowded quarters of the

steerage. The ship was quarantined upon arrival in New York Harbor, and was not allowed to proceed until the quarantine officers were sure that all traces of the disease had disappeared; yet to this ship and the Swansea, which reached New Orleans at about the same time from the same port, is attributed the terrible outbreak in this country in 1849. These instances might be multiplied, all tending to show that the most rigid examination as hitherto practised did not reach the desired end.

It would seem that safer precaution would consist in the thorough cleansing of all clothing, bedding, etc., belonging to immigrants and crew at quarantine, not by fumigation exclusively, but by washing and disinfecting by means of bi-chloride of mercury or some other equally powerful disinfecting or destroying agent.

Fortunately there is a greater unanimity of opinion among medical experts regarding the conditions favorable to the propagation of cholera than concerning its primary causation. History teaches many valuable lessons in this connection, and a close and careful scrutiny of its pages will prove of inestimable value as a guide to intelligent sanitation. The restriction of the disease to certain portions of its endemic and epidemic areas has been very widely noticed by writers on the subject. In India, we are told that during the great epidemic of 1817 prisoners confined in jails and garrisons quartered in infected districts, dependent upon subsistence from their own commissaries and upon water sources confined to their own precincts, were almost without exception exempt from the ravages of the disease, notwithstanding the fact that the mortality in the immediate neighborhood was appalling. The wide distribution of prisons and military posts in that country, and their comparative immunity from the disease, is strong evidence in favor of the contact theory of its transmission. The results of local isolation in various parts of Europe, and in the United States, corroborate this view, notably the absence of cholera epidemics among United States troops quartered throughout the infected districts of the Mississippi Valley in 1873, the date of our last visitation.

The power of dissemination which characterizes this disease in localities possessing certain hydrometric peculiarities has

been very widely noticed and as freely commented upon. Seaport, lake, and river towns, and inland places in low and marshy districts, seem to possess this power in a marked degree. The introduction of cholera to such places, usually lying along the great commercial highways, is easily accounted for; but its widespread dissemination must be attributed to local conditions. We have much corroborative testimony touching this point from many sources. The report of the superintending surgeon of the Cawnpore district in India for 1833, says:

"The year has been remarkable for an uncommon degree of heat and the prevalence of destructive epidemics. This has not been caused by deficiency of rain, the total fall being thirty inches in fifty days, while last year there were but eighteen inches, and the season was a most healthful one. *Every slight fall of rain was attended by an increase of the disease*, and it did not entirely disappear till the end of September, when the weather cleared up."

The Calcutta Medical Board, in its report of September 6th, 1817, at the time cholera was epidemic at Jessore, says that:

"No considerable town in the low and humid climate of Bengal is at present exempt from its operations."

A Chinese writer tells us that the appearance of cholera on the coast of China was attributed by the natives to a great dense cloud which arose from the Yellow Sea and swept slowly inland, carrying the disease with it, but not distributing it beyond its own pathway.

Numerous instances are recorded of sudden outbreaks of cholera after heavy rainfalls, and during the prevalence of dense fogs accompanied by high temperature. There are apparent exceptions to this view of the agency of atmospheric humidity in propagating the disease—the prevalence of cholera in portions of India, for instance, during the dry months. But the absence of rain does not of necessity indicate high barometric pressure by any means. The cessation of the disease after heavy rainfalls can be easily attributed to the dilution of stagnant pools and the removal of the germs of the disease by filtration into deep sandy soils, or by the outward flow of the accumulated waters beyond the reach of human kind.

During the prevalence of the epidemics in this country since 1832, it has been noticed that hot, stagnant, moist weather greatly favored the spread of the disease. It must be borne in mind in this connection that the hot, dry weather, so called, is most favorable to the evaporation of moisture from the soil, and this moisture may act as a vehicle for the resurrection of germs which have been absorbed from dejecta and lain dormant in situations unfavorable for their development, but which, upon reaching the atmosphere, find conditions favorable to growth and lodgment. Experiment with the coma-bacilli of Koch has proven that moisture with heat favors their development and growth.

The localizing power of the disease may be attributed to another cause—that of low sanitary condition. This power may show itself directly by the introduction into the body of the disease germs through contaminated drinking water from wells, cisterns, and sluggish streams in situations exposed to the wash of dejecta which have not received proper treatment at the hands of sanitary officers; or, indirectly, through the predisposition of individuals induced by deleterious personal habit or impure surroundings. The contamination of drinking water in wells and cisterns which are in close proximity to cesspools and outhouses, so often the case in country villages and crowded portions of cities not supplied with water systems, is of very common occurrence, giving rise in ordinary seasons to malarial and typhoid-fevers, dysentery, etc., and inviting widespread devastation during the prevalence of a cholera epidemic. The ravages of this disease among the Russian peasantry during *the winter time* has been attributed solely to the habit of drinking water from pools about their hovels formed by melting snow, upon which the dejecta of cholera patients has been thrown.

Geological formation theories have been advanced to account for the local presence of the disease; but it may be safely asserted, we think, that such ground is untenable. The presence of outcropping limestone or clay subsoils serves only to render the water supply available, and when contaminated to make its direful influence felt.

Personal habit is an active factor, not so much, perhaps, in the propagation of the disease as in its increased mortality.

Poverty, intemperance, vice, indulgence, filth, all contribute to greatly increased mortality. It has been noticed that pay and *fête* days during an epidemic have been followed by a marked increase of choleraic activity, generally attributable to over-indulgence in eating, and alcoholic excesses. Do not understand me to say that drunkards are doomed during an epidemic. Some writers have claimed immunity for this class, probably because their only beverage gives the most active coma-bacilli but a short lease of life. But low habit from any cause predisposes the individual to the reception of the disease in its most malignant form.

A most powerful ally of choleraic propagation is fear. The depression of the vital forces, and the relaxation of the nervous system, opens the way for the easy access of the disease and its fatal termination. Dr. Holcombe, in a very able paper read before the Southern Medical Association in New Orleans, last December, on the influence of fear, says:

"The mind of man is constantly at work, silently pervading every tissue of his body by its vital influence, repeating itself in every function, throbbing in the heart, breathing in the lungs, reflecting itself in the blood, weaving its own form into every act of nutrition, realizing its own life in every sensation, and working its own will in every motion."

We have all recognized the subtle influence of the mind over the body in the sick-room. Carlyle's aphorism, "The very look of his face blesses or curses whomso it lights upon," is certainly applicable to the physician. A bright face and a cheery smile in the presence of the sick may prove far more potent than the remedy the physician prescribes, while the baleful influence of the long-drawn face, the bated breath, and the whispered consultation may blast the hopes and so alarm the patient as to produce a morbid state of mind, which could not but increase the chances of a fatal termination of the disease. Such psychical influences are especially active during destructive epidemics such as cholera. The shadow of fear seems to hang over every one, and the appearance of the disease in a community is the signal for a panic, when the gates of the citadel are thrown wide open and the enemy is invited to enter.

The history of Asiatic cholera in the United States dates back to 1832. On the 28th day of April of that year the emi-

grant ship Constantia, of Limerick, with one hundred and fifty-one passengers on board, stopped at Grosse Isle, seven miles below Quebec. She had lost twenty-nine passengers by cholera at sea, but the abatement of the outbreak was considered sufficient guarantee against further danger, and the immigrants were forwarded to Quebec. The quarantine regulations at this point called for no specified detention, nor for the examination or disinfection of baggage. Other ships from Ireland speedily followed, and the tide of immigration brought thirty thousand souls to Canadian waters from scourge-ridden Europe during that season. Free intercourse was maintained between quarantine and outlying points. The soiled clothing, bedding, and baggage of living and dead was taken ashore for renovation, and before the summer days were gone two thousand two hundred and eight deaths were reported for Quebec and one thousand eight hundred and forty-three for Montreal, besides numerous cases all along the line of the plague's march. On up the river it swept, radiating in different directions along the line of travel; down Lake Champlain to Whitehall, thence to Albany and Schenectady, and along the Erie Canal westward into the Great Lakes and down their shores.

The first appearance of cholera in New York City, the great objective point for immigration in North America, is shrouded in mystery. No authentic reports are available of cases prior to those at Quebec. The general impression is that an Irishman by the name of Fitzgerald was the first attacked in the metropolis. There is every reason to doubt this, however, as Fitzgerald had been resident two months in New York before he was stricken with the disease. The statement of Dr. Westervelt that cholera had reached New York before the date of its entrance into the St. Lawrence, but that the announcement of its presence was withheld for prudential reasons by the health board, seems far more reasonable than that it should have been introduced overland from Canada. The fact that no records can be found of arrivals at quarantine in New York Bay from April to July, 1832, goes to substantiate the Westervelt statement that the facts in the case were suppressed. At this time the Black Hawk War was engaging the attention of the United States authorities, and recruits were being forwarded to different commands in the West. Seven

companies left New York, June 23d, and embarked on board the steamer Henry Clay, at Buffalo, July 1st. Prior to this the vessel had been used for transporting emigrants from Canadian waters. After the embarkation there was a delay of two days before the vessel proceeded to her destination. Cholera broke out the day following, and two deaths from the disease occurred before the Henry Clay reached Detroit River. Proceeding up the river to a point designated by the Detroit authorities, the troops and their baggage were landed one mile below Fort Gratiot. By this time the epidemic had assumed alarming proportions and most malignant form. Consternation seized the raw recruits, and nearly the whole command deserted, spreading the disease in all directions. The crew of the Henry Clay then attempted to return to Buffalo, but stopped at Cleveland on the evening of July 9th. The day following an official bulletin announcing her arrival with cases of Asiatic cholera on board was published by the board of health. The crew were permitted to land, but were placed in strict quarantine, and although deaths occurred in their little encampment, the disease did not apparently spread from there, but became epidemic a few days later from a woman landed by a passing steamer while she was suffering with diarrhœa.

Cholera made its appearance in Cincinnati some time early in October. It had been claimed that the first case, that of a teamster, was developed September 30th, but its presence in that city was strenuously denied by the authorities until October 9th, after which it became epidemic, and further concealment was, of course, useless. Columbus, Carthage, Dayton, and other points inland were visited during the fall, but the season was too far advanced to admit of the widespread devastation that was predicted by the panic-stricken people. Low sanitary condition and fear undoubtedly contributed very largely to its spread. One of my medical students succumbed to it while on his way home from my office, after learning of the presence of the disease in the village of Norwalk, and the announcement that he would be expected to assist in the care of cholera patients. No premonitory symptoms had shown themselves, but the panic which seized this young man when brought face to face with the dreaded visitor battered down all his powers of resistance and made him an easy victim.

The spread of the disease Westward during the summer and fall of 1832 was rapid and thorough. The movements of troops marked out its course, and before winter set in it was epidemic throughout the lower and upper lake regions, the Mississippi and Ohio valleys, and the Mohawk and Hudson valleys in New York State. It had radiated from New York City Eastward throughout New England, Southwestward across New Jersey into Maryland, and Southward by water to Charleston, S. C. It had penetrated overland to Forts Gibson and Smith, United States outposts far up the Arkansas River, and by way of the Missouri River to Fort Leavenworth. In his report to the Secretary of War, September 1st, 1832, General Scott concludes as follows:

"I am fully aware of the heavy responsibility that rests upon me for the spread of a dreadful malady among the troops under my orders, and through them prematurely among the population of this immense valley. I have never regarded myself as having been born to be a curse to my country. On the contrary, it has always been the first wish of my heart to serve her gloriously, but my care and foresight amid recent events have been signally defeated. I have, without getting into battle myself, brought disease and death upon those who vanquished the public enemy. To the new danger I have freely and fearlessly exposed myself without utility. My heart is deeply afflicted and humbled. But if I cannot show that I have employed extraordinary care and exercised even more than common sagacity to prevent the evil which I lament, I ask to be subjected to universal execration."

With the dreaded Indian foe in front, a more insidious one in his very camp, limited means of transportation and communication, and constant desertions, the position of this brave officer was, indeed, a trying one. But the events of future years brought no condemnation to the self-sacrificing, generous-hearted old warrior, who laid aside the sword he had so honorably worn only when the weight of years had palsied the hand that had wielded it through two wars, and was ready to carry it into a third.

Slowly retreating Southward before the advancing winter, the disease passed into Mexico and the Central American States, and over into Cuba, where, renewing it strength, it turned backward in 1833, and, pushing up the Mississippi River and its tributaries, became epidemic over nearly the

same areas it had occupied in 1832. Strangely enough, its advent in 1834 was by the way of Grosse Isle in the St. Lawrence and along the line of its first invasion, and in 1835 from New Orleans Northward again.

Unfortunately, there was at this time a prevalent belief that the disease was contagious, that its spread was due to atmospheric movements, and not to actual contact, as has been since established, and the records which we have of its various courses during the first epidemic are very meagre. The experience of the next few years, however, led astute and painstaking physicians to reject the contagion theory, and to accept in its place the theory that its communicability was closely connected with its diarrhœal commencement through the development of germs actually received into the stomach and intestines through food and drink contaminated with choleraic poison. But this theory had not received very great publicity, and when, in 1848, the ships New York and Swansea reached America, as has been already noted, they found an easy quarantine, especially the latter vessel, at New Orleans. Other ships, with emigrants from infected places in Europe, but not directly from infected ports, as they brought with them clean bills of health, followed, and soon the disease was epidemic throughout the United States, extending even to California, at this time the Mecca for the worshippers of the golden calf. It is doubtful if cholera absolutely disappeared from North America from this time to the general outbreak in 1854. Deaths from the disease were reported from different points in the interval between 1849 and 1854, but so few as not to excite more than passing comment. The history of subsequent epidemics in this country is familiar to all of us, and the limits of this paper will not permit of their extended mention, even if there were need of it. The brief sketch of the first invasion of the disease, which has been attempted, is intended more to show the portability of the disease from man to man through the customary channels of individual and commercial intercourse, and to invite discussion as to the value of strict quarantine measures.

It would seem, in view of the warnings given the American people in 1832, that a repetition of the horrors of that and subsequent years was impossible. But the intolerant bigotry

of individual tenets respecting the development and spread of the disease, to say nothing of the ignorance and cowardice of the time, left wide open the only gates which might have barred its future entrance. Successive visitations of this disease, however, and of yellow-fever, and the constantly increasing area of malarial and typhoid-fevers, have had the effect of removing the dross of prejudice, ignorance, and indifference, and revealing the fine gold of helpful sanitation.

From the brief sketch here attempted of a subject so vast in its proportions, we do not feel justified in making logical deductions, but from the great mass of cumulative evidence, which has been collected by scientists throughout the world, and with which we are all more or less familiar, the following conclusions may, we think, be legitimately drawn and very profitably discussed :

1. That Asiatic cholera is indigenous to India, and becomes epidemic elsewhere only by exportation through the ordinary channels of social and commercial intercourse.

2. That it becomes epidemic after importation by the operation of the laws and customs prevailing in different countries regulating the relations of individuals and communities.

3. That proper authority may so modify such relations, in the time of public danger, as to confine its depredations to narrow limits and to speedily accomplish its eradication.

4. That fear, the most powerful ally in the spread of the disease, should be allayed by educating the people through the medium of the daily press to a full understanding of its characteristics and the easy means of escaping its ravages.

The first of these conclusions justifies the enforcement of a strict quarantine ; not the old-time quarantine of arbitrary detention and herding of sick and well together, but a reasonable one, such as the exigencies of modern civilization demand and the advance of scientific method makes possible. The disembarkation of passengers and crew with all their baggage and effects, the separation of the sick and well, the thorough and speedy disinfection and renovation of all effects, the thorough cleansing of the vessel, and the detention of all those who show premonitory symptoms for a period covering the time of incubation, would, under efficient management, accomplish the desired results, and yet cause a delay to all

concerned of but a day or two at the outside. Such a system, we believe, is in operation at New Orleans, and its efficiency is unquestioned in view of the fact that it has practically excluded yellow-fever from that port for the past seven years. The contrast between this quarantine station and the crude and inefficient one at New York, the great centre of immigration to this country, points to the necessity of relegating all quarantine management to the General Government, so far as points of entry are concerned, at least, and the spirit of existing commercial competition between different ports clinches the argument in its favor. It is, besides, unfair to burden seaboard States with the expense of excluding a common enemy of all the States. But whether under governmental or local control, the quarantine should be made thoroughly and absolutely effective, and no time should be lost in accomplishing that end in view of the close proximity of this dreaded foe.

Under the second head, we would counsel a cheerful obedience on the part of an intelligent public to the mandates of her sanitary officers—men who are, in the highest sense of the term, public philanthropists. These officers are for the most part medical practitioners, who are constantly curtailing their own incomes in their efforts to promote public health—a sort of self-sacrifice which shows itself in no other profession or line of business.

In the third place we would advocate the exercise of eternal vigilance on the part of health officers as the price of immunity from this scourge. Scientific investigations of the morbific properties of choleraic poisons, within the four walls of the chemical laboratory, are very well in their way, and are to be encouraged; but house-to-house visitation, the abatement of nuisances wherever found, the thorough inspection of foods and drinks, a fearless discharge of every duty, and the education of the masses up to a higher standard of personal hygiene will prove of far greater general value in keeping the pestilence from our doors.

Finally, we appeal to the public press to exert its powerful influence in allaying the ill-timed dread which seizes upon the populace at the approach of this fearful disease. A knowledge of its characteristics, of its non-contagious properties, of the possibility of personal immunity by the exercise of careful

habit and cleanliness, of the use of pure water and wholesome food, of the character of premonitory symptoms, and of the ease with which they are controlled, will present an invulnerable front to the advance of the plague.

In this connection we would refer to the advantages of inoculation. That it is a specific against the attack of the disease I am not prepared to offer an opinion, but that a belief in its efficacy on the part of the public will give additional security I do not doubt. In Spain, where inoculation has been widely practised, statistics show that few of those who are so treated are attacked. This is a fact which is pregnant with thought to the medical profession.

The old adage, "Those whom the gods would destroy they first make mad," has broad signification in the presence of the pestilential darts of Apollo, which find a wide mark in the superstitions and traditions which have been handed down from remote antiquity. But as the years advance and knowledge becomes more universal, the Goddess of Reason shall be enshrined in the hearts of our people, and her worship will secure to them immunity from the poisoned shafts through the wide dissemination of the truths of sanitary hygiene.

SHOULD SYPHILIS BE MADE A LEGAL BAR TO MATRIMONY?

By C. E. Beardsley, M.D., Ottawa.

THE subject of syphilis seems to be of widespread interest to all nations and all classes of people.

Scarcely can we pick up a medical journal, published in the New or Old World, without finding one or more well-written papers, from personal observation and experience, upon the subject of syphilis and its treatment. So widely spread is the disease, that no country, as far as I can learn, is exempt from its ravages. Its foot-prints are not only recognized in Europe and America, but Africa's tropical climate and Russia's frigid zone have had no bar to its advent and progress.

So familiar have the medical profession become with its symptoms and signs, that it may be recognized through sev-

eral generations of a syphilitic family, and I doubt if it can ever be eradicated beyond recognition. I need not point out to you in this discussion the symptoms of syphilis, with which you are all too familiar. So marked are they in the precocious child, the tuberculous, the rheumatic, the rickety, the thin, the blue skinned, the notched teeth, that even the laity have recognized it. I had under treatment for nearly two years a case of syphilis. This patient came under observation with the initiatory chancre. I put him on mercury internally and externally, and in a comparatively short time he seemed entirely to recover, but by my advice he continued the mercury in the form of small doses of the biniodide for some two years, when he married. Their first child had many symptoms characteristic of a syphilitic taint; as it grew older those symptoms could not be mistaken. This child died before it was one year old, from some intervening disease, superimposed on the syphilitic diathesis. The second child was born eighteen months subsequent; it was wrinkled and old in appearance, with a *fortit coryza*. By a course of mercury and potassium iodide, the child seemed to fully recover, now being sixteen years of age; yet I am able to find the foot-prints of syphilis. Subsequently another son was born, who, up to three years of age, seemed to be perfectly healthy.

No apparent trace of syphilis could be discovered. This boy died from an obscure intestinal trouble. Subsequently three others have been born; all were well-marked syphilitics. The parents of this husband were healthy, as were his brothers and sisters, none having a scrofulous taint. The same remarkable physical health obtained on the mother's side. Yet with the precautions of two years of celibacy and a continual course of specifics for the same length of time in the husband, I failed to prevent transmission of syphilis to his children. I could give you here several other cases from my own observation, resulting in like consequences, but do not care to worry you with a detail.

From observation of cases and a strict analysis of the same, I am constrained to look upon the disease, syphilis, as a specific disease, produced by a specific germ or virus, which attacks every tissue of the body, causing changes therein which time and medicine cannot efface, and those changes, or efface-

ments, are as transmissible as any form of an organ of the body—the flat or the Roman nose. I am fully aware that I am not in accord with all authors in my views, but I, for one, admit no author to be infallible and an unerring guide to my opinions. At the same time, I am quite ready to admit their unbounded resources, their erudition, their honesty of conviction, and their careful analysis of syphilitic cases; but they are only men, and may be deceived. I am also quite satisfied that there are cases of syphilis which seem to have entirely recovered, that show no signs of syphilis, nor do their children. Why this is so I know not, but it seems to me to be the exception to a rule of which the reverse is the true course. I have seen one case which had had two attacks of constitutional syphilis, each time from a primary sore. Why this second attack, if the patient was not cured of the first, is as mysterious to me as an individual having two attacks of small-pox. Yet we have no evidence that the patient was not laboring under a latent form of his former attack at the time of contracting his second chancre, he only requiring some irritation to unfold this latent spark.

There is scarcely any non-specific disease which does not have many of the symptoms of a specific character, and the specific always assumes the garb of the non-specific disease, which may be governed by a particular diathesis. Thus I am led to believe that many non-specific cases, so-called, coming before us, have had a diathesis planted many generations in the past by a specific germ which has marked this peculiarity in the type of all diseases. I am led to this by observation and treatment of cases known to be specific in character. I once had two cases which contracted the disease from the same source. One I treated with mercury and the potassium iodide; the other with simply a solution of sulphite of soda. The former case passed through the secondary stage very tardily, and is yet under treatment; the latter one had a few rupia on the forehead and scalp, which passed off in a few weeks, and is now convalescent. But can we say that it has not left a condition which may not mark the next generation with a cancerous or phthisical diathesis? The laws of heredity answer this in the affirmative. That the disease does exist long after all physical symptoms and signs have subsided is

well attested in cases where vaccine lymph is taken from subjects which had had all the symptoms either of acquired or hereditary syphilis, and it has produced the specific disease in those vaccinated.

Again, it is self-evident that it not only resides in the blood corpuscles and plasma, but in the minutest cells. The spermatozoa contains this virus, which, in many instances, only requires conditions to liberate and develop it as germs of a seed plant. If planted in fertile soil it will develop and multiply, destroying, in the one instance, the health and happiness of the parent and child, filling the world with paupers; on the other, destroying the fertility of the soil and burdening the land with noxious weeds. Admitting that there seems to be a limit in time wherein syphilis may be communicable, say three to five years, yet who knows that latent syphilitic germs may not be awakened by some other disease, which breaks down the containing protoplasmic cell?

This we have seen in cases which were apparently healed of the malady for many years, and upon some slight provocation broke out in all the virulence of a tertiary type of syphilis. Does not the same law hold good in syphilis that does in all acquirements? That is, that that which is acquired by an individual is prone to be transmitted; it may be modified by the environments and idiosyncrasies, but not entirely left out of the count. My observations and studies of syphilis, in the acquired and hereditary types, have led me to believe that physicians, and the laity, in general, treat it in much the same manner as attorneys and witnesses do the judicial oath in courts of justice—that is, their testimony would lead an observer to infer that the God of retribution was too far off to take cognizance of a syphilitic or a perjurer. It seems to me, if condign punishment were meted out immediately to each transgressor, both in the moral and statute laws, there would be less syphilis and less perjury. If all transgressions ended with suitable punishment of the transgressor, then could we "beat our swords into pruning-hooks" and disband this society, resting our faith on the "survival of the fittest;" but the frailties of men too often live after them in their offspring. What man acquires physically and mentally is to a degree transmitted, under the domination of an artificial life which

surrounds him, and these acquisitions are rather detrimental than beneficial to him and his posterity. So conspicuously true are the laws of heredity that temperaments of all shades are produced by favorable crossing, as well as diseases, a law which has become so well established in our profession that we are many times able to foretell the diseases incident to the offspring, knowing those of the parents.

Dr. Carpenter said the influence of parents on the constitution of offspring is strikingly manifested, not alone in the mixture of their normal characters, but also in the tendency to hereditary transmission of perverted modes of functional activity which have been habitual in either parent. Here we might illustrate out views more fully by quotations from Darwin and many others, but the law of heredity is self-evident. The predisposition to particular diseases may have been congenital on the part of the parents, or may have been acquired of themselves; thus, many diseases are accounted as hereditary; and perhaps others not so accounted now may be added to the list in the future. The truth of inherited diseases is seen all about us, in syphilis, gout, phthisis, scrofula, insanity, intemperance, and in almost every catalogued disease.

In contemplating the scope of heredity in the transmission of diseases, in the marking of bones and tissues by diseases peculiar and characteristic of themselves, I have been led to believe that it is a duty we owe to ourselves, and mankind, in general, not only to lend an "assisting hand," but to be leaders in what I conceive to be one of the wisest, grandest, and best reformations since the birth of Christ, for the salvation of the bodies, if not the souls of mankind.

This may be accomplished by several methods—namely, isolation, quarantine, educated selection, educated respectability and responsibility, education in all the attributes of a manly man. Morally, "doing unto others as you would be done by." Those who know and care not for this moral code, let them be tried by the more exacting code of duty to society and posterity—namely, unsexing both the male and female.

To the "prince of diseases"—syphilis, let us turn our sanitary and educational efforts, and not cease until syphilis is as dead as the Chicago Anarchists. Man made governments before which treason trembled, and by which they punished its

offenders even unto death. Is man less able to protect himself, and to punish this "*monster treason*"—syphilis—which makes inroads into the bosoms of the first families of our land?

Is it possible we, as sovereigns of this country, pay such grave attention to the ravings of a madman (John Brown), and the windiness of youthful fanatics (the Anarchists), as to cost this Government (the sovereigns) millions of money in attempting a suppression of an idea? Yet "the soul of John Brown is marching on," and the Anarchists' souls will be painted with wings, which paintings will decorate many humble abodes as martyrs of liberty of thought and speech, and not one cent is contributed to the suppression of the greatest of all evils. Yes, I have but little doubt that syphilis is the corner-stone of all unjust fanaticism, as diseased brains produce diseased thoughts and actions.

Why does not the strong arm of the Government (the people) put forth its energies and suppress it as a rebellion to the best interests of all, knowing its rendezvous, and the modes of infection? If it were small-pox, cholera, yellow-fever, less destructive diseases, what a cry for help would be sent up along the line! Sanitarians would hasten to the scene with quarantine orders in one hand, individual isolation and test tubes in the other, seeking the cause or causes of one single death, perhaps ten or more, and the ominous Professor Owlet, M.D., to test the specific action of some patent medicine discovered by a German savant (antipyrine), *secundum artem*. Why is this? Syphilis is admitted by all to be more destructive to the well-being of mankind in general than all the above diseases and fanaticisms combined, yet very few voices are heard counselling its abatement by a coersive power, which we believe to be practicable. Books have been and are now being written instructing us how to treat individual cases of syphilis. Medical journals teem with peculiar cases, shaded by some idiosyncrasy, with treatment *ad nauseum*, but not one word as to a general preventive, that the innocent, unborn, unconsulted child, who is to be a citizen, may escape the penalty of a broken law.

I conceive that medicine, both as an art and science, has occupied itself too much with individuals and not enough with

generalizations. It has studied only to relieve the present suffering of the individual and to prolong his life; the physical well-being of the whole race has been left almost entirely without consideration.

Much more noble is it to prevent diseases than to cure them, to keep out the germs of diseases, than to find a specific to destroy them. It is a noble mission to relieve the sufferer, but nobler to prevent suffering. If we were to study more closely, and apply the knowledge thus gained, death would come to all as the shades of evening fall on the well-ripened harvest.

In closing this discussion, allow me to recapitulate. Educate the people in self-preservation; quarantine as in all contagious and infectious diseases; individual isolation; registration; enforced celibacy; last, but not least, orchidotomy for the male, and oophorectomy for the female having constitutional syphilis.

Perhaps this seems a little severe, viewed from the present standpoint of our civilization, which is emerging slowly from beneath old superstitions, dogmas, and creeds, and, not less so, the creed of Phallic worship.

The fundamental principles upon which our Government was founded—liberty and happiness of all—led me to bring this subject before you, that through you this end may be obtained. I do not advocate any punishment of the homicide, nor of the adder, if their stings were not poisonous to man and a destroyer of society and its happiness.

Grant to all life, liberty, and the pursuit of happiness, when such grants do not conflict with the happiness and liberties of others.

A BILL introduced in the Kentucky Legislature in the interests of heredity, well-intended, but loosely and unpractically designed, prohibits "marriages with an idiot, lunatic, paralytic, pauper, vagrant, tramp, drunkard, gambler, felon, feeble-minded person, or any one rendered physically helpless and unfit for the marriage relation, any person with violent temper, or who has for one year previous been a frequenter of any immoral house, or has been divorced for such causes."

CREMATION AS A SANITARY AND ECONOMIC MEASURE.

By Lew Slusser, M.D., Canton.

To compress the work assigned to each session of this Association within the time allotted by the programme will not allow the introduction of the proof collected in support of the alleged evils of inhumation. We must therefore assume that the members of this Association are already informed on the subject, if not from personal knowledge, from reports and publications that have appeared within the last decade.

The aim and object of this Association is the discussion of questions of sanitation, the dissemination of knowledge bearing upon public health, the investigation of causes that produce sickness, create or direct public opinion, to the end that human happiness may be augmented and human life prolonged.

That the present mode of disposing of the dead by inhumation is fraught with evil to the living will be conceded by every one who has given the subject any consideration. The decomposition of human remains pollutes the soil, the water, and the air around and about it. Committees composed of learned, scientific men of England, France, and Germany, after close and careful investigation, unite in reporting that "water from graveyards contains ammonium and calcium nitrites and nitrates, fatty acids, and much organic matter." Lefart found a well three hundred and thirty feet from a cemetery "to be largely contaminated with ammoniacal salts and an organic matter which was left on evaporation; the water, though clear at first, had a vapid taste, and speedily became putrid." Instances abound illustrating the fatality attending the consumption of water contaminated by proximity to graveyards. Well-attested cases of cholera, dysentery, and typhoid-fever have been directly traced to the use of water from wells in the vicinity; in fact, so well is this understood, that as a general rule, such water is not considered potable. In 1859 ground was purchased at the outskirts of the city of my home for a

new cemetery. At the place of entrance to the grounds was a well belonging to a dwelling-house. For years visitors to the cemetery were in the habit during the summer months of stopping at this well to take a drink of the water, which was considered very palatable. Within the last few years it was frequently remarked that it had a peculiar taste and smell. Last summer extensive improvements were being made in the grounds, and on a hot, sultry day ten or twelve men working near the well drank freely of the water. The consequence was that all who partook of the water were made sick—suffered from nausea, and had diarrhœa. In the section of the cemetery immediately above the well, and within a radius of one hundred and fifty yards, there are five hundred bodies interred. That this well water has become vitiated by drainings from decomposed human bodies there cannot be a doubt.

The observations of Darwin, and the more recent experiments of Pasteur, demonstrate beyond question the great danger of depositing animal remains in the earth. These experiments conclusively show that splenic-fever, which depends on a specific germ emanating from the dead bodies of animals, victims of this disease, is propagated by these germs being brought to the surface through the instrumentality of earth-worms. The details as given at length in publications upon the subject carry conviction to the mind of the reader. We prosecute our investigations into the *microme* world to little purpose if not disposed to use every means attainable to suppress or control their operations. The popular idea that water filtered through sand and gravel becomes purified, or the noxious ingredients removed, is a fallacy. No filtration will remove micro-organisms. Nothing short of heat to the boiling point will destroy the septic qualities of water, and by some it is claimed that combustion to complete annihilation is necessary. Instances are upon record where the removal of bodies of persons who had died from small-pox and scarlet-fever, after having been buried thirty years, was the cause of reviving the disease in the immediate neighborhood. To stamp out a contagious or infectious malady, or arrest its progress, incineration should be made general. Its benefits are limited when confined to isolated cases. The objector should be compelled to submit when the public health is in danger.

It is a well-known fact, proven in many instances, both in Europe and America, that where a receiving vault is constructed underneath the chapel, the mephitic gases evolved from decaying corpses and permeating the auditorium have been the cause of sickness and death.

The evil results of inhumation being manifest, the question arises, How can it be avoided? The idea has been advanced by many well-meaning persons that it would be better if decomposition of the body were hastened by a more speedy commingling with the earth, substituting coffins of wicker-work or *papier-maché*. While that preparation for interment would undoubtedly shorten the time of decomposition, so long as the supply was kept up the results would be the same.

There are other objections to inhumation besides the unsanitary aspect. We venture the assertion that there is not a county-seat in Ohio in which the inhabitants are not annoyed by the presence of an abandoned and neglected graveyard. Most of the bodies having been removed to a cemetery with modern improvements, those left are without friends living who are willing to keep up the grounds, and as a consequence they are allowed to grow up with unsightly weeds, and left open to the depredations of roaming animals and juvenile vandals. In many instances, as in my own city, the municipal authorities are powerless to rid themselves of the evil, as by a late decision of the State Court, land donated for a specific purpose cannot be appropriated to any other purpose, even by legislative action; and thus the old graveyard remains, a perpetual eyesore, and a nuisance to the community residing in the neighborhood.

If it were possible to deposit the remains of every deceased person in the States in the alkaline regions of the great West, where the flesh and bones could be utilized as a fertilizing agent to reclaim the land, inhumation might be tolerated another century; but when we consider the effect of the crowded condition of burial-grounds adjacent to our populous cities, the consequences must eventually be terrible. The increase of population in this country is appalling. If the theory of Malthus be correct, that the time is approaching when the earth will not yield food sufficient to sustain the inhabitants, where, then, shall the dead be buried?

From the earliest periods of recorded time there were different modes of disposing of the dead. Among some of the barbarous tribes of Africa, the body is allowed to remain in the house until it becomes putrid; then the nearest relative carries it outside the village and places it on the surface of the ground to decompose and mingle with the earth. Other tribes place their dead in trees, either in the forks or lashed to the limbs, to be devoured by vultures. Mummification or embalming was the custom among the Egyptians, and incineration the general custom among the more enlightened in ancient times. The old Romans—whose sayings we are wont to quote—Cæsar, Antonius, Brutus, Octavius, Augustus, Tacitus, and many other distinguished men of that age, were cremated. And why was not the custom continued? Some writers give as a reason that it was because of the pomp, ceremony, and expense attending it, which the middle and poorer classes were unable to afford. Then it was that the custom commenced of depositing the remains in natural caves, from whence followed inhumation, which has continued to be the popular mode to the present day. An article has been going the rounds of the papers that a firm in Philadelphia had obtained letters patent for a process whereby the dead body could be converted into stone, as large as life, and quite as natural, well adapted to ornament the parlor and library. Whether the public are inclined to encourage this enterprise is questionable. Our natural instincts rather lead us to become reconciled to a removal of the body out of sight, when bereft of the soul, though pleased to perpetuate the memory by portraits and statues of marble and brass.

Viewed in a sanitary light, there can be no question as to the advantages of cremation. The only plausible objections are those founded on sentimental considerations. To overcome these, which are grounded on prejudice, it is only necessary to realize the pollution of the body in the course of ordinary decomposition; commenting upon which, Sir Spencer Wells says: "Public sentiment must favor cremation in place of corruption, and for putrefaction substitute purification." Sentiment is mental emotion, the result of education. The Hindoo widow has the same constituent properties of brain, acknowledged to be the seat of the mind, as the Anglo-Saxon,

and she believes it to be her religious duty to sacrifice her life upon the pyre of her deceased husband. What proportion of our married women could be wrought up to make this sacrifice, and yet, had they been born in India, and educated in the schools of that country, they would have done just as the women do there, and conscientiously believed they were doing right.

The disposal of the dead body is only a matter of form, or fashion, it may be termed, and that mode should be preferred which works the least harm to the living. "Ashes to ashes" is the appropriate finale of mortality. In contrasting cremation with inhumation, an eminent Swiss physician and philanthropist uses the following language: "The grave presents the most terrible spectacle which it is possible to conceive, whether the body within it is that of a prominent statesman under a magnificent monument or a pauper in a potter's field. In either case a most foul and intolerable stench meets the daring investigator who opens the abode of peace. And however great the horror and disgust caused by the sense of smell, the impressions produced by inspection are yet more horrible. The brain, the noblest part of man, which may shortly before have furnished the wisdom that saved an empire, has fallen out of its bony case, a shapeless, unctuous, sticking mass, abhorred even by the worms which so ravenously seize upon the flesh, the heart, the lungs, and especially the intestines. The eye-sockets are empty, and every part, except the bones, is rotten, revolting, harrowing to the senses in the highest degree." And then he propounds the question, "Why, in the name of a merciful God, should we subject ourselves and those we love to so dreadful a condition while science at once offers us ways and means of avoiding it, by a rapid and complete destruction of the body?" "Verily the man of sensibility, animated by pious reverence for the dead, who, laying aside all illusions and self-deception, and aided at once by science and by imagination, looks into the grave and for a moment watches the process of decay, will never again speak of the common mode of sepulture as the mode enjoined by respect, or inspired by affection or by tenderness for the departed."

The desecration of the grave, though not frequent in pro-

portion to the number of bodies interred, yet it does occur, and will continue to occur, and, when known, how harrowing to the feelings of the living friends! Stolen for the purpose of obtaining a ransom, as in the case of A. T. Stewart, and as was attempted with the remains of the martyred Lincoln, or for the dissecting-table, as in the case of a son of a President of the United States. Who would not prefer that his remains be annihilated rather than be subjected to such an indignity?

In this connection we would mention the fact that when the General Government, at the close of the war, established National Cemeteries, and gave out by contract the recovery and reinterment of the thousands who fell in battle and died from disease, the contractor, obtaining from reports on file an approximate estimate of the number to be recovered, took the contract at so much a body delivered in a box on the ground selected for the cemetery. As it was less trouble to gather the small bones of horses and mules, lying around promiscuously, than to search for the remains of a soldier entombed in an unmarked grave, bones other than human were in many instances substituted, in order to fill out the complement supposed to have been interred in the vicinity. What a burlesque on the sanctity of the tomb! How much better reconciled would be the parents and friends of the fallen to know that the remains were completely destroyed—not a vestige remaining!

Why should our bodies be preserved, food for worms? We are but an air-bubble upon the stream of time—play our part, and then disappear, soon to be forgotten. How much more in accordance with our ideas of life, death, and eternity would it be that, when life is extinct, the inanimate lump of clay remaining be destroyed. The famous men of this country have monuments erected to perpetuate their memories. Rather than that there should be a contention where the remains should lie, let them be cremated and the ashes scattered to the four winds.

Many who believe in cremation are deterred from advocating it, because not sanctioned by public opinion. Who make public opinion? The leaders of society. Since Henry Ward Beecher condemned the custom of hanging crape on the outer door as an insignia of death in the house, and advocated white flowers as a substitute, flowers are now the style in Brooklyn

and other Eastern cities. Had General Garfield and General Grant left orders that their bodies be cremated in order to save the expense of guarding their graves from ghouls, and the rivalry excited where they should be entombed, stock in crematories would now pay better than the undertaking business.

In regard to the economic feature of the measure, it will be conceded that the expense attending funerals at the present day is, in many instances, extremely burdensome to the living. Millions are annually expended in the United States in useless and extravagant display on funeral occasions, the effect of which is demoralizing because it influences others to compete who can illy afford the expense. There is not a gentleman present who has not been made aware of a serious pecuniary embarrassment to which a family has been subjected by reason of a foolish pride, that they must on the occasion of a funeral equal or surpass the display made by a neighbor.

How is this evil to be corrected? Unquestionably by adopting a cheaper mode of disposing of the dead body. When we have small-pox, cholera, or yellow fever, we are governed in our care of the sick and the disposal of the dead upon business principles. Measures are taken to quarantine the sick and dispose of the dead without regard to sentiment. Why not be governed by the same business principles in the disposal of the dead generally?

The average cost of a funeral in Ohio is not less than one hundred dollars, without considering the value of the land appropriated to cemeteries, which amounts to millions. The expense of cremating the body would be less than one fifth this amount, provided the crematory was as near as the cemetery. The nearest crematory to my place of residence is distant one hundred miles, and yet to dispose of the body in the righteous way by incineration will cost less than one half, after defraying all expenses of transportation and extra preparation, than it would by inhumation.

The medico-legal aspect involved in the consideration of the question should have but little weight when it is considered that embalming, now so generally practised, offers as ready means as cremation of concealing the traces of poison administered to kill. With the introduction of the new method there would doubtless be an increase of vigilance—the selection of a functionary whose business it would be, upon the least

suspicion, to delay proceedings and institute a thorough investigation.

Reforms are proverbially of slow growth, yet it is a source of gratification to know that the sentiment in favor of cremation is growing. From a small crematory built by Dr. La Moyne, of Washington, Pa., for his own family, some ten years ago, there are now in active operation in this country six or more —one each at Lancaster, Buffalo, Cincinnati, New York, and Pittsburg. In the latter natural gas is employed as the fuel, by means of which a body can be reduced to ashes in thirty minutes. Incorporated associations have been formed in most of our large cities for the purpose of educating the public and raising funds preparatory to the erection of a crematory. The civilized portions of the Old World are quite active on the subject. A crematorium was completed in Paris last year capable of reducing to ashes forty-five hundred bodies annually. A commendable feature in the controversy now being waged on the subject, is the fact that most of the writers in favor of incineration belong to the medical profession. None are better qualified to judge of the pernicious influence which the dead exercise over the living. With the aid and comfort furnished by such men as La Moyne, Dio Lewis, and Dr. Gross, who has been the Gamaliel of our profession, the friends of the new departure may feel encouraged.

The movement has been indorsed as a "sanitary necessity" by the Society of Medical Jurisprudence and State Medicine of New York, the American Public Health Association, and the American Medical Association.

May the time be near at hand when cremation of the dead shall be substituted for inhumation, thereby removing all danger to the living, at the same time giving no offence to any Christian doctrine, intelligent faith, or healthy sentiment.

CONCLUSION.

The following resolutions were adopted:
(By Dr. G. C. Ashmun, of Cleveland):

Whereas, The State of Ohio, from its relation to other parts of the country, is exposed to invasion by dangerous contagious and pestilential diseases; and whereas such diseases are liable to enter the State at points poorly able to either defend themselves or the rest of the State from further extension, therefore,

Resolved, That the Ohio State Sanitary Association respectfully recommend and urge the appropriation of not less than ten thousand dollars, to be set aside and subjected to the control of the Governor of the State, with the advice of the State Board of Health, for the purpose of aiding in the prevention of epidemics of dangerous contagious diseases in the State.

Resolved, That the secretary of this Association be and is hereby instructed to transmit a copy of these resolutions to the presiding officers of both branches of the Legislature.

(By Dr. D. H. Beckwith, of Cleveland):

Resolved, That, in accordance with the suggestions of the annual address of the president of this Association, the directors of the forthcoming Ohio Centennial Exposition, at Columbus, be and are hereby respectfully requested to make as full provision as practicable under the department of science and education for the display of the leading divisions of the science of public health, including sanitary apparatus and equipments of all sorts, and models or examples of the proper means of disposing of sewerage.

(By Dr. John McCurdy, of Youngstown):

Resolved, That the thanks of the Association are hereby expressed to the physicians of Toledo for their efforts in making our meeting pleasant and successful, to his Honor the Mayor for his address of welcome, to the people of Toledo for their courteous attention during our sessions; also the press of Toledo, especially the *Blade*, for their full and able reports of the proceedings, and the railroads for their courtesies.

The following officers were elected: President, G. C. Ashmun, M.D., Cleveland; Vice-Presidents, Dr. John McCurdy, Youngstown; Professor Edward Orton, Columbus; Dr. Samuel S. Thorn, Toledo; Secretary, Dr. R. Harvey Reed, Mansfield; Treasurer, Dr. D. H. Beckwith, Cleveland.

Executive Committee: Dr. Lew Slusser, Canton; Josiah Hartzell, Esq., Canton; Dr. L. S. McEbright, Akron; Dr. John McCurdy, Youngstown; Dr. H. J. Herrick, Cleveland.

The Association adjourned to meet at Canton, O., November 15th and 16th, 1888.

E. T. NELSON, Ph.D., *President*,
Delaware, O.

R. HARVEY REED, M.D., *Secretary*,
Mansfield, O.

EDITOR'S TABLE.

ATTENTION is particularly invited to our CHANGE OF ADDRESS. *All* correspondence and exchanges, and all publications should be addressed :

113A Second Place, Brooklyn, N. Y.

YELLOW-FEVER, which found such easy entrance into Florida last year under the propitious influences of the Plant Steamship Company and its abettors, beginning with the junketing party of so-called health officers in January, 1887, to which we have before taken occasion to refer, appears to have gained a foothold in that congenial climate and soil which is likely to hold its own proportionally with the vulnerable subjects.

The fomitic *débris* of Florida is so extensive and so well adapted to give the disease a permanent foothold that it will be difficult to promise any security from the efforts which are likely to be used for stamping it out. The local physicians, excepting a few who appear to be either purblind to, or ignorant of the fever and the conditions promotive of it, have, for the most part, come to the conclusion, though reluctantly, that the danger can no longer be hoodwinked.

Dr. Murray, U.S.M.H. Service, reports from Plant City, March 13th : "There is yellow-fever at this place, and evidently at other places in the State. Suppressive measures are being instituted here. The greatest desire is held by the health authorities to not have publicity given to the facts in the case, although rumors are spreading rapidly. . . .

"Drs. J. P. Wall, King Wylly, F. H. Caldwell, J. Y. Porter, and others advise that no public notice be given until a chance is given for complete checking of the fever here where it is most prevalent. In their view I join for many reasons, and trust that your office will consider this confidential" !

Four days later he reports from Key West : ". . . That I sought for unfavorable facts and had no right to make my mission known made it difficult to get prompt information. The rumors of doubtful fevers, and the frost and ninety-day theories, compelled nearly all to be reticent, or, at least, unwilling talkers. . . .

"At Jacksonville a continued fever, affecting the highest circle of society *only*, has been prevalent for over two months, resulting in from 6 per cent to 8 per cent of deaths, which presents the general characteristics of enteric-fever. This name is given by Dr. R. P. Daniel, who has treated most of the cases, and is concurred in by Drs. C. J. Kenworthy, J. D. Fernandez, and A. W. Knight. I fancy that Dr. N. Mitchell considers some of the cases more seriously, and know that Dr. J. C. L'Engle (not a practitioner) holds the idea of a yellow-fever wave overspreading the city.

"Similar cases had lately occurred in St. Augustine and Mandarin. In spite of local prejudices and a few unproven charges which arouse suspicion, I think the fever at Jacksonville is enteric; but few doctors in South Florida will join in my opinion.

"Dr. J. G. Ames claimed that Palatka had cases of yellow-fever in the autumn, but was now free from all suspicion or risk of infection.

"Drs. Caldwell and Wylly, at Sanford, insist that the town of Sanford had from 100 to 150 cases in the autumn, with 6 deaths, and that mild cases are still occurring as late as my visit—the 6th and 7th—and later, one on the 13th. Georgetown and Mellonville, villages near Sanford, present suspicion.

"Lakeland, the junction of the South Florida and Florida Southern railroads, is prostrate in a business point of view from the presence of imported cases during last fall, but it was impossible for me to get any clew to recent cases from Drs. Perry, Derio, Marshall, Hart, Preston, and Vineyard.

"At Plant City, junction of Florida Railway and Navigation Railroad with South Florida Railroad, twenty-two miles east of Tampa, cases have occurred since October 5th—say, 120 cases and 9 deaths. The last death (the ninth) on March 11th; the last case sickened the same day.

"On March 8th Mr. Calhoun convalesced at Box Springs, Talbot County, Ga., from yellow-fever engendered during one month's stay in Plant City, he having left for his home about February 27th.

"Tampa is declared free from fever by Drs. J. P. Wall and J. A. Jackson; but as there has been no radical system of cleansing in vogue, the place is by no means above doubt.

The wife of Dr. Bruce evidently died of yellow-fever about January 20th.

". . . Micanopy, on the Florida Railway and Navigation Railroad north of Plant City, and Bartow, south of Lakeland, are presumably danger points at present.

" It is evident to me, painful as the idea is, that the lines of railroad from Tampa to Jacksonville are at various points infested by *fomites* which will, at the proper time, give all the trouble prophesied by Dr. Caldwell. The region south of the South Florida Railroad seems to be more secure, except Manatee, but is by no means safe. . . .

" I cannot see any good to come from a publication of my opinions. Savannah is already warned, and all the chief cities are on the lookout.

" Passed Assistant Surgeon Glennan is entitled to much credit for his forethought and courage in informing you of the expected and perhaps inevitable damage to the State."

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

☞ It would greatly add to the interest of the reports under this head if all correspondents would give estimates of the *death-rates per* 1000 *of population per annum*, by which different populations could be compared.

ALABAMA.—*Mobile* reports for the month of March 59 deaths in a population estimated at 40,000, of which 12 were under five years of age; representing an annual death-rate of 17.7 per 1000. From zymotic diseases there were 4 deaths, and from consumption, 10.

CALIFORNIA.—Reports received by the Secretary for the month of March, from 99 localities in different parts of the State, indicate a considerable diminution of diseases as compared with the preceding month.

Small-pox caused 15 deaths. Although the disease is no longer declared epidemic in San Francisco, it still lingers in that city; 23 cases were reported during the month, 3 of them Chinese, recently imported; in Oakland, 4 cases; in Eureka,

Humboldt, 5; in Millville, 2; in Redding, 3; in Stockton, 21; in San Bernardino, 2; in Riverside, 6. In Los Angeles there were *many* cases, the number of which the health officer neglected to report. It also appeared in Ocean Side, Downey, Monrovia, Ontario, Point Reyes, Gilroy, San José, Santa Cruz, Watsonville, Sissons, West Point, Murphys, Duncan's Flat, San Andreas, Sheep Ranch, Alvarado District, Merced, and perhaps other points not reported.

Diphtheria and croup caused 39 deaths—10 only in San Francisco, which shows a great diminution of the disease in that city, as compared with the preceding month. Measles, 24; scarlet-fever, 10.

CONNECTICUT.—The Secretary reports for the month of March the total number of deaths returned by 153 towns, comprising a population of 701,937, 1170, representing an annual death-rate of 20, as against 19.06 for the preceding month.

Scarlet-fever is still prevalent in 18 different towns, scattered through five different counties, but only 16 deaths from it indicate its mild character. Diphtheria and croup, 40 deaths—also widespread—in 23 towns representing every county in the State, but not more fatal than in February. Typhoid-fever, 11 deaths against 9 in the preceding month. Measles, though widespread, is subsiding. "The general health was quite equal to the average for the month, and considering the widespread prevalence of scarlet-fever, was exceptionally good."

The *lowest death-rates* of the 28 towns with 5000 inhabitants and upward were in Windham, 12; Derby, 13.1; Norwich, 13.4; Middletown and Stratford, each 15, and Naugatuck, 16.

The *highest death-rates* of the 28 towns with 5000 inhabitants and upward were in Greenwich, 34.5; Stamford, 28.2; Enfield, 25.7; New Britain, 23.3, and Norwalk, 23.2. The average of the whole 28 towns was 19.2.

DELAWARE.—*Wilmington* reports for the month of March 79 deaths in a population estimated at 57,000, of which 27 were under five years of age. Death-rate, 16.63 per 1000. From zymotic diseases there were 4 deaths, and from consumption, 17.

ILLINOIS.—*Quarterly Meeting* of the State Board, Chicago, April 19th–20th. The Secretary presented his report for the quarter ending March 31st, during which he said there had been no serious increase of the mortality rate, as a whole, notwithstanding the exceptional severity and sudden changes of the meteorological conditions.

Of *small-pox*, three new cases had been reported and traced during the quarter, but such prompt and energetic measures had been applied that, thus far, there is no evidence of its spread. An additional case was reported in Reno during the session of the Board. "It is entirely possible to make Illinois small-pox proof in a fortnight. But to do this requires that the individual citizen, as well as the school authority and health officer, do his part in the work. It is the duty of every householder to see to the vaccinal protection of himself and of every inmate of his household."

Cholera, the Secretary very properly remarks, continues to threaten, and "this country cannot be regarded as safe from the menace of cholera so long as—on the one hand, and under existing conditions of maritime quarantine—we continue to receive large numbers of immigrants with their household effects from the recently cholera-infected districts of Europe; and, on the other, so long as the disease continues its ravages on the South American Continent."

Water Supplies continued to be the subject of investigation throughout the State. In furtherance of the subject, a circular and forms of inquiry have been prepared by the Secretary, with a view to collecting practical data on the relations of the water supplies of places to sickness in different seasons, and as related to the depth of soil water; also data with regard to the geological strata—the nature, thickness in feet and inches, etc. —in sinking wells.

Wear and Tear of the Medical Profession is made the subject of comparison with other professions, showing the higher death-rate of the votaries of medicine and the reasons of it.

"For the first time since the collection of vital statistics was begun all the counties have made returns of births and deaths. These, which are for the year 1887, show a general improvement and increased fulness. A total of 32,164 deaths and a total of 62,337 births are reported for the whole State, being

an increase of 2762 death returns and 3144 birth returns, as compared with the returns of the previous year."

IOWA.—*Monthly Bulletin* reports for the month of March:

Keokuk.—Total deaths, 15. Consumption, 2; croup, 1. Births, 41.

Davenport.—Total deaths, 38. Diphtheria, 4; scarlet-fever, 1; membranous croup, 1; consumption, 2. Births, 52. For the month of February, total deaths, 28. Consumption, 6. Births, 23.

LOUISIANA.—Dr. C. P. Wilkinson, the recently appointed President of the State Board of Health, recognizes the fact that his predecessor, Dr. Holt, has already created an economical, reasonable, and safe system of quarantine; that the system has been thoroughly tested and improved from time to time, and has thus far proved to be eminently successful. Hence, he announces, as executive officer of this Board, its policy is to follow faithfully the previous administration of this system, without any change whatever. The biennial report of Joseph Holt, M.D. (noticed in April number), he announces as the platform on which he stands. Every provision therein set forth, the enforcement of which has so materially advanced the public welfare, will be carried out actively and rigidly.

The new president's inaugural was received with eminent satisfaction by the Board, and was followed by the adoption of highly complimentary resolutions to the retiring president, Dr. Holt.

New Orleans reports for March 299 deaths in 180,000 white population, and 174 deaths in 68,000 colored population—making the respective death-rates 19.93 and 37.70 per 1000, and 22.88 for the whole population of 248,000. The deaths from zymotic diseases numbered 49, and from consumption, 78. There were 139 deaths under five years of age.

MARYLAND. Seventh Biennial Report received.—*Baltimore* reports for five weeks ending March 31st, 820 deaths in a population estimated at 437,155, of which 386 were under five years of age. Death-rate, 22.6 per 1000. From zymotic diseases there were 118 deaths, and from consumption, 149.

MASSACHUSETTS.—*Boston* reports for March 895 deaths in 400,000 population, of which 278 were under five years of age. Death-rate per 1000, 26.8. From zymotic diseases there were 114 deaths, and from consumption, 138.

MICHIGAN.—The Secretary reports for the month of March, 1888, compared with the preceding month, that tonsillitis increased, and that remittent-fever and bronchitis decreased in prevalence. Compared with the average for the month of March in the nine years, 1879–87, measles was more prevalent, and intermittent-fever, diphtheria, consumption, remittent-fever, pneumonia, whooping-cough, scarlet fever, and inflammation of kidneys were less prevalent.

Including reports by regular observers and others, diphtheria was reported present at 25 places, scarlet-fever at 30 places, typhoid-fever at 13 places, measles at 49 places, and small-pox at 1 place.

Reports from all sources show diphtheria reported at 15 places less, scarlet-fever at 12 places less, typhoid-fever at 4 places less, and measles at 10 places more in the month of March, 1888, than in the preceding month. Small-pox was reported present at 1 place both in February and in March, but has now disappeared from the State.

Compared with the preceding month, the temperature for the month of March, 1888, was higher, the absolute humidity was slightly more, the relative humidity was slightly less, and the day and the night ozone were less. Compared with the average of corresponding months for the preceding nine years, 1879–87, the temperature was slightly lower, the relative humidity was more, the absolute humidity and the day and the night ozone were less.

Detroit.—The Health Officer reports for the month of March 313 deaths in a population estimated at 200,000, of which 60 were under five years of age; representing an annual death-rate of 18.42 per 1000. From zymotic diseases there were 43 deaths, and from consumption, 45.

MINNESOTA.—*Public Health in Minnesota* reports for the month of March: Diphtheria, 70 cases, 27 deaths; scarlet-fever, 43 cases, 4 deaths. In addition two pages of elaborate statis-

tics of returns of deaths filed in the office of the Secretary up to the 15th of the same month are given: Deaths, 1055; under five years of age, 130; from diphtheria in 46 localities, 87; typhoid-fever in 14 localities, 30; scarlet-fever in 8 localities, 13; puerperal-fever in 18 localities, 30; erysipelas in 9 localities, 12; infantile debility in 51 localities, 80; infantile convulsions in 26 localities, 52; still-born in 28 localities, 43; phthisis in 54 localities, 90; pneumonia in 52 localities, 90; bronchitis in 192 localities, 32; but all without reference to population or any data showing the different death-rates in different localities, and therefore, in this respect, valueless for comparison with other populations and places.

Diseases of animals reported for the month of March: Cases of glanders remaining isolated or not accounted for, 65; reported during the month, 48; killed, 47; released, 18; isolated, 16. Remaining, April 1st, isolated or not accounted for, 48.

St. Paul.—The Health Officer reports for the month of March, 1888: Deaths, 164; under five years of age, 88. Death-rate per 1000, 13.12. From zymotic diseases, 40, and from consumption, 8.

MISSOURI.—*St. Louis* reports for the month of March 796 deaths in a population estimated at 420,000, of which 283 were under five years of age; representing an annual death-rate of 22.7 per 1000. From zymotic diseases there were 133 deaths, and from consumption, 82.

NEW JERSEY.—*Hudson County* (Jersey City) reports for the month of March 540 deaths in a population estimated at 263,370, of which 167 were under five years of age. Death-rate, 24.6 per 1000. From zymotic diseases there were 67 deaths, and from consumption, 62.

Newark reports for the month of March, in a population of 169,728: Deaths, 368; under five years of age, 147. From zymotic diseases, 58, and from consumption, 36. Death-rate, 25.97.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 129 towns of 3000 inhabitants and upward, com-

prising a population of about 3,500,000, for the month of March, 9405, of which 30.0 per cent were under five years of age. In each 1000 deaths there were 147.37 from zymotic diseases; of these 11.20 were from diarrhœal diseases; 8.00 from typhoid-fever; 25.50 from scarlet-fever; 71.32 from diphtheria. Of the 33 deaths from small-pox, 19 occurred in the Kings County Hospital (where also 14 deaths not reported in the February *Bulletin* occurred). There has been some increase in the prevalence of this disease in New York and Brooklyn, the former reporting the existence of 54 cases during the first three weeks of April. Single cases have been reported from the towns of Attica, Warwick, Mt. Pleasant, Potsdam, and Aurelius. From consumption 128.22 deaths occurred in each 1000 total mortality, and 291.25 from consumption, zymotic, and puerperal diseases combined. From acute respiratory diseases there were 184.25 deaths per 1000 total mortality. Cases of glanders in horses are reported from numerous localities; a law just passed makes it the duty of local boards of health, under regulations of the State Board, to destroy all such animals.

New York City, for the same month, population, 1,526,081: Deaths, 3554, representing an annual death-rate of 27.42. Deaths under five years, 1370, 38.5 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 18; typhoid-fever, 13; malarial diseases, 21; small-pox, 14; scarlet-fever, 106; measles, 17; erysipelas, 24; whooping-cough, 28; croup and diphtheria, 294; diarrhœal diseases, 64; zymotic diseases per 1000 deaths from all causes, 168.56. Consumption, 514; acute respiratory, 702; puerperal diseases, 55.

Dr. Roger S. Tracy, the Registrar of the City Board of Health, has recently made an analysis and comparison of the mortality statistics of New York and London.

The population of New York is given at 1,439,037, while that of London is 4,149,533, the figures of 1886 being used in the report, the London vital statistics of 1887 not being at hand. The excess of deaths in New York over London in the following diseases is shown by one of the tables: Small-pox, 65; scarlatina, 380; diphtheria and croup, 6390; typhus-fever, 27; typhoid, 319; cerebro-spinal meningitis, 639; puerperal diseases, 575; malarial-fevers, 1109; diarrhœal diseases,

5942; erysipelas, 150; alcoholism, 250; phthisis, 7383; pneumonia, 5928; tabes mesenterica, 322; tubercular meningitis, 943; meningitis, 1058; sunstroke, 121 (none in London); cirrhosis and hepatitis, 405; Bright's nephritis, 4955; cyanosis and atelectasis, 594; suicide, 246; premature births, 195; drowning, 241; violence, 1362.

London showed an excess of 160 in measles, 1214 in whooping-cough, 146 in rheumatism and gout, 439 in cancer, 6308 in bronchitis, 236 in heart diseases, 6 in aneurism, 886 in convulsions, 19 in apoplexy, and 446 in diseases of the brain and nervous system. Of several tables comprehending the period of twenty years, 1867–87, the excess of mortality in New York over London is found to be mainly due to diphtheria and croup, diarrhœal diseases, phthisis, pneumonia, and diseases of the kidneys. But with regard to pneumonia, there is in London a great excess of deaths from bronchitis, upon which Dr. Tracy remarks, the difference is probably due to the classification of broncho-pneumonia as bronchitis in London, while it is classified as pneumonia in New York.

The tables fairly demonstrate that the excess of mortality in New York as compared with London is due to diphtheria and croup, diarrhœal diseases, phthisis and kidney diseases, and the increase or decrease of deaths from these causes from year to year will indicate, in some degree, improvement or deterioration in the sanitary condition of the city.

His *conclusions* are:

1. That the excess of mortality in New York, as compared with London, is due chiefly to diphtheria and croup, diarrhœal diseases, phthisis and kidney diseases.

2. That if the death-rate from these diseases were the same in New York and London, the mortality from all other causes remaining as at present in both cities, the general death-rate in the two cities would be almost precisely the same.

3. That the overcrowding in New York (16.37 persons to a dwelling in 1880, as compared with 7.8 in 1881 in London) and the trying climatic conditions render it very improbable that the death-rate of this city can ever be reduced as low as that of London.

Brooklyn, 757,755: Deaths, 1594; death-rate, 24.76; deaths under five years, 556—33.5 per cent of total. From zymotic

diseases: Typhoid-fever, 2; malarial diseases, 12; scarlet-fever, 70; measles, 4; erysipelas, 8; whooping-cough, 9; croup and diphtheria, 140; diarrhœal diseases, 15; zymotic diseases per 1000 deaths from all causes, 162.52. Consumption, 183; acute respiratory diseases, 352; puerperal diseases, 25.

Buffalo, 202,818, for five weeks ending March 31st: Deaths, 466; death-rate, 23.89; deaths under five years, 193—41.4 per cent of total. From zymotic diseases: Cerebro-spinal meningitis, 3; typhoid-fever, 2; malarial diseases, 7; scarlet-fever, 9; measles, 9; erysipelas, 6; whooping-cough, 3; croup and diphtheria, 31; zymotic diseases per 1000 deaths from all causes, 160.90. Consumption, 48; acute respiratory diseases, 81; puerperal diseases, 7.

Rochester, 110,000: Deaths, 157; death-rate, 17.14; deaths under five years, 50—29 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 1; erysipelas, 1; croup and diphtheria, 12; zymotic diseases per 1000 deaths from all causes, 101.91. Consumption, 25; acute respiratory diseases, 20.

Albany, 96,000: Deaths, 235; death-rate, 29.37; deaths under five years, 72—30.7 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 6; small-pox, 1; scarlet-fever, 2; erysipelas, 1; croup and diphtheria, 5; diarrhœal diseases, 6; zymotic diseases per 1000 deaths from all causes, 97.75. Consumption, 38; acute respiratory diseases, 38.

Syracuse, 78,000: Deaths, 125; death-rate, 19.23; deaths under five years, 42—33.6 per cent of total. Deaths from zymotic diseases: Malarial diseases, 2; scarlet-fever, 2; measles, 2; erysipelas, 1; croup and diphtheria, 17; diarrhœal diseases, 2; zymotic diseases per 1000 of total, 208. Consumption, 22; acute respiratory diseases, 19; puerperal diseases, 2.

Lowest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the lowest death-rates during the month of February were: Lockport (15,000), 5.60.; Ithaca (10,000), 8.40; Hempstead (18,160), 8.67; Gloversville (10,000), 10.80; Auburn (26,000), 12.00.

Highest Death-rates: The five cities or towns of the State of 10,000 inhabitants and upward having the highest death-rates during the same month were: Newtown (10,000), 42.00;

Poughkeepsie (20,200), 35.64; Ogdensburg (11,000), 31.64; Saratoga Springs (10,000), 30.00; Albany (96,000), 27.37.

NORTH CAROLINA.—*Bulletin* reports for the month of March pneumonia in 27 counties, but generally of a light type. Four of the counties were eastern, 11 middle, and 12 western. Measles in 19 counties—9 eastern, 7 middle, and 3 western. Meningitis, cerebro-spinal, occurred in 1 middle county and 3 western, none in the eastern. Typhoid-fever in 11 counties—2 eastern, 3 middle, and 5 western. Whooping-cough in 13 counties—2 eastern, 7 middle, and 4 western. Diphtheria in 1 eastern and 4 middle counties. Mumps in 2 middle and 3 western counties. Small-pox, 1 case appeared in Goldsboro, brought in from New York City on the person of an emigrant. Prompt measures of isolation and vaccination arrested the spread of the disease.

Hog-cholera in 4 eastern, 2 middle, and 1 western county. Chicken-cholera in 1 eastern, 1 middle, and 1 western county. Pink eye among horses occurred in 1 middle county.

Mortality Reports of Towns, ten of them reporting: There were 26 deaths from consumption in 9 towns, the other town not making specific enough report to determine; 9 were among the whites, 11 among the blacks, 6 deaths not designating the races. Pneumonia is next in number, from which disease there were 20 deaths, of which 8 were among the whites and 12 among the blacks. Brain diseases, under which head is included cerebro-spinal meningitis, there were 11 deaths, 9 of which were among the whites, 2 among the blacks. Measles gives an aggregate of only 3 deaths. Malarial-fever gives an aggregate of only 2 deaths.

PENNSYLVANIA.—*Philadelphia* reports for five weeks ending March 31st, 2060 deaths in a population estimated at 1,016,758, of which 598 were under five years of age. Death-rate, 21.0 per 1000. From zymotic diseases there were 194 deaths, and from consumption, 305.

Pittsburgh reports for five weeks ending March 31st, 380 deaths in a population estimated at 210,000, of which 155 were under five years of age. Death-rate, 18.08 per 1000. From zymotic diseases there were 31 deaths, and from consumption, 42.

RHODE ISLAND.—*Newport* reports for March, 27 deaths in a population estimated at 20,000, of which 8 were under five years of age. Death-rate per 1000, 16.2. From zymotic diseases there was 1 death, and from consumption, 5.

TENNESSEE.—*Memphis.*—Dr. J. B. Thornton, President of the Board of Health, reports for 1887: Population, 62,335, one third colored. Deaths, 1469—whites, 673, colored, 796; death-rates—white, 16.73, colored, 35.97 : 23.56; 194 white and 289 colored—28.81 per cent of the former and 36.31 per cent of the latter—were of children under five years; 200, or 13.61 per cent, of all the deaths were caused by consumption; 269 white—39.94 per cent—and 266 colored—33.41 per cent—respectively, were caused by zymotic diseases, the chief of which were diphtheria, 27 white and 17 colored; typhoid-fever, 27 white, 15 colored; malarial-fever, 31 white, 54 colored; congestive-fever, 54 white, 37 colored, and diarrhœal diseases, 63 white and 67 colored.

But little progress was made in the extension of sewers during the year, of which there are now a fraction less than 40 miles in successful operation; and considering the rapid growth of the city and the soil fouling in the outer wards for the want of water-closets, the President of the Board earnestly urges progress, and again urges attention to the necessity of straightening and improving the condition of the open sewer —the Bayou Gayoso.

VIRGINIA.—*Richmond* reports for the month of March: Deaths, 166, of which 44 were under five years of age. Death-rate per 1000, 19.92. From zymotic diseases there were 10 deaths, and from consumption, 29.

INFECTIOUS DISEASES ABROAD.

By returns at hand from abroad, the number of deaths reported during the *three months* ending *March 31st* was from:

Small-pox in Sheffield, 318; Prague, 265; Paris, 103; Havre, 57; Trieste, 55; Marseilles, 35; Vienna, 23; Rheims, 17; Nice, 16; Bristol, 15; Manchester, 13; Leeds, 13; Lyons, 13; St. Petersburg, 12; Bucharest, 8; Nantes, 7; Pesth, 7; Cairo, 6; Presburg, 5; London, 4; Hull, 3; Bordeaux, 3; Besançon, 3; Munich, 3; Amiens, 2; Venice, 2;

Brussels, 2; Liverpool, Glasgow, Dublin, Rouen, Odessa, Alexandria, each 1.

Measles in London, 228; Liverpool, 9; Glasgow, 31; Birmingham, 91; Manchester, 12; Dublin, 36; Leeds, 5; Sheffield, 1; Edinburgh, 81; Bradford, 25; Belfast, 125; Bristol, 7; Hull, 1; Newcastle, 5; Amsterdam, 37; Rotterdam, 14; Paris, 187; Lyons, 140; Marseilles, 57; Bordeaux, 40; Nantes, 38; Saint Étienne, 4; Havre, 44; Rouen, 27; Rheims, 44; Nancy, 5; Amiens, 6; Besançon, 6; Berlin, 51; Hamburg, 119; Munich, 16; Dresden, 11; Leipzig, 5; Koenigsberg, 1; Hanover, 28; Bremen, 3; Chemnitz, 1; Dantzig, 3; Stuttgart, 3; Strasburg, 37; Altona, 5; Barmen, 2; Mayence, 17; Lausanne, 3; Chaux-de-Fonds, 4; Vienna, 69; Pesth, 52; Prague, 46; Trieste, 4; Debreczin, 11; Presburg, 3; Copenhagen, 30; Stockholm, 11; Christiania, 160; St. Petersburg, 172; Odessa, 3; Venice, 17; Bucharest, 13; Cairo, 1; Brussels, 8; Anvers, 41; Gand, 10; Liege, 3; Bruges, 18; Malines, 1; Verviers, 2; Tournay, 11; Alost, 17; Roulers, 1; Turnhout, 1; Wetteren, 2; Grammont, 62; Thielt, 1; Binche, 2; Braine-le-Comte, 1; Wavre, 1; Morlanwelz, 1; Fleurus, 3; Blankenberghe, 1.

Scarlet-fever in London, 414; Liverpool, 53; Glasgow, 40; Birmingham, 14; Manchester, 51; Dublin, 72; Leeds, 29; Sheffield, 45; Edinburgh, 8; Bradford, 19; Belfast, 14; Bristol, 12; Hull, 14; Newcastle, 4; Amsterdam, 3; Rotterdam, 5; Hague, 4; Paris, 69; Lyons, 12; Marseilles, 4; Bordeaux, 2; Nantes, 1; Saint Étienne, 7; Havre, 1; Rouen, 8; Rheims, 5; Nancy, 3; Amiens, 26; Nice, 1; Besançon, 6; Berlin, 43; Hamburg, 29; Breslau, 3; Munich, 18; Dresden, 8; Leipzig, 15; Cologne, 3; Magdeburg, 11; Frankfort, 14; Koenigsberg, 3; Hanover, 1; Nuremberg, 9; Bremen, 3; Chemnitz, 3; Dantzig, 34; Stuttgart, 3; Strasburg, 9; Elberfeld, 6; Aix-la-Chapelle, 1; Mayence, 6; Bale, 9; Geneva, 5; Lausanne, 14; Chaux-de-Fonds, 2; Vienna, 74; Pesth, 15; Prague, 44; Trieste, 12; Debreczin, 10; Presburg, 4; Copenhagen, 67; Stockholm, 53; Gothenburg, 10; Christiania, 16; Helsingfors, 1; St. Petersburg, 13.3; Odessa, 4; Bucharest, 7; Jassy, 2; Brussels, 1; Anvers, 8; Gand, 4; Bruges, 6; Tournay, 2; Bergerhout, 1; Wetteren, 1; Thielt, 1; Hornu, 2.

Fevers.—Typhus and Typhoid in London, 236; Liverpool, 40; Glasgow, 26; Birmingham, 16; Manchester, 28; Dublin, 53; Leeds, 13; Sheffield, 11; Edinburgh, 12; Bradford, 3; Belfast, 26; Bristol, 8; Hull, 9; Newcastle, 8; Amsterdam, 14; Rotterdam, 4; Hague, 2; Paris, 247; Lyons, 17; Marseilles, 74; Bordeaux, 58; Nantes, 16; Saint Étienne, 3; Havre, 20; Rouen, 28; Rheims, 7; Nancy, 7; Amiens, 3; Nice, 16; Besançon, 4; Berlin, 81; Hamburg, 150; Breslau, 7; Munich, 10; Dresden, 8; Leipzig, 8; Cologne, 1; Magdeburg, 7; Frankfort, 4; Koenigsberg, 15; Hanover, 4; Düsseldorf, 4; Nuremberg, 3; Bremen, 2; Chemnitz, 169; Dantzig, 2; Stuttgart, 5; Strasburg, 4; Elberfeld, 3; Altona, 31; Barmen, 7; Aix-la-Chapelle, 7; Mayence, 1; Metz, 2; Bale, 1; Geneva, 1; Berne, 5; Lausanne, 1; Chaux-de-Fonds, 4; Vienna, 27; Pesth, 42; Prague, 67; Trieste, 4; Debreczin, 5; Presburg, 3; Copenhagen, 8; Stockholm, 11; Gothenburg, 2; Christiania, 2; Helsingfors, 6; St. Petersburg, 284; Odessa, 12; Venice, 6; Bucharest, 26; Jassy, 8; Cairo, 128; Alexandria, 14; Port Said, 1; Brussels, 25; Anvers, 11; Gand, 33; Liege, 18; Bruges, 10; Malines, 3; Verviers, 1; Louvain, 2; Tournay, 8; Seraing, 3; Bergerhout, 3; Mons, 1; Jumet, 3; Alost, 3; Charleroi, 1; Lokeren, 3; Gilly, 1; Turnhout, 1; Marchiennes au Pont, 1; Wasmes, 1; Herstal, 1; Eecloo, 6; Jemappes, 3; Tamise, 2; Grammont, 1; Iseghem, 2; Binche, 2; Arlon, 1; Tongres, 3; Gosselies, 1; Diest, 1; Morlanwelz, 1; Furnes, 1; Dixmude, 1.

Diphtheria and Croup in London, 504; Liverpool, 24; Glasgow, 113; Birmingham, 20; Manchester, 28; Dublin, 39; Leeds, 7; Sheffield, 12; Edinburgh, 52; Bradford, 2; Belfast, 13; Bristol, 4; Hull, 2; Newcastle, 9; Amsterdam, 27; Hague, 10; Paris, 559; Lyons, 77; Marseilles, 148; Bordeaux, 41; Nantes, 25; Saint Étienne, 36; Havre, 23; Rouen, 26; Rheims, 46; Nancy, 4; Amiens, 19; Nice, 20; Besançon, 5; Berlin, 297; Hamburg, 111; Breslau, 121; Munich, 60; Dresden, 61; Leipzig, 60; Cologne, 27; Magdeburg, 50; Frankfort, 61; Koenigsberg, 45; Hanover, 43; Düsseldorf, 22; Nuremberg, 65; Bremen, 7; Chemnitz, 22; Dantzig, 26; Stuttgart, 12; Strasburg, 33; Elberfeld, 14; Altona, 22; Barmen, 25; Aix-la-Chapelle, 1; Mayence, 9; Metz, 18; Bale, 6; Geneva, 1; Berne, 12; Lausanne, 3;

Zurich, 2; Chaux-de-Fonds, 2; Vienna, 125; Pesth, 118; Prague, 99; Trieste, 32; Debreczin, 12; Copenhagen, 110; Stockholm, 36; Gothenburg, 6; Christiania, 112; Helsingfors, 3; St. Petersburg, 201; Odessa, 19; Venice, 4; Bucharest, 46; Jassy, 12; Cairo, 9; Alexandria, 2; Brussels, 64; Anvers, 19; Gand, 42; Liege, 17; Bruges, 17; Malines, 12; Verviers, 4; Louvain, 1; Tournay, 6; Seraing, 1; Bergerhout, 9; Jumet, 1; Alost, 16; Charleroi, 1; Roulers, 20; Lierre, 7; Gilly, 1; Turnhout, 13; Marchiennes au Pont, 1; Hasselt, 4; Boom, 4; Wasmes, 1; Uccle, 6; Herstal, 3; Hamme, 11; Lederberg, 2; Wetteren, 2; Grammont, 29; Iseghem, 3; Termonde, 1; Boussu, 4; Arlon, 8; Braine-le-Comte, 6; Hornu, 3; Wavre, 4; Ninove, 2; Koekelberg, 3; Fleurus, 1; Blankenberghe, 2.

Whooping-cough in London, 1618; Liverpool, 89; Glasgow, 175; Birmingham, 55; Manchester, 65; Dublin, 81; Leeds, 42; Sheffield, 28; Edinburgh, 34; Bradford, 13; Belfast, 103; Bristol, 21; Hull, 14; Newcastle, 13; Amsterdam, 71; Rotterdam, 21; Hague, 19; Paris, 90; Lyons, 11; Marseilles, 14; Bordeaux, 12; Nantes, 2; Saint Étienne, 3; Havre, 17; Rouen, 1; Rheims, 2; Amiens, 3; Hamburg, 48; Breslau, 15; Munich, 34; Cologne, 4; Vienna, 27; Pesth, 4; Prague, 16; Trieste, 17; Debreczin, 18; Copenhagen, 40; Stockholm, 24; Gothenburg, 18; Christiania, 20; Helsingfors, 2; St. Petersburg, 46; Odessa, 10; Bucharest, 10; Cairo, 61; Alexandria, 6; Port Said, 1; Brussels, 22; Anvers, 38; Gand, 13; Liege, 8; Bruges, 8; Malines, 1; Louvain, 1; Tournay, 9; Seraing, 1; Alost, 8; Roulers, 1; Lokeren, 5; Uccle, 7; Jemappes, 2; Vilvoorden, 7; Thielt, 1; Binche, 1; Maldeghem, 21; Gosselies, 2; Braine-le-Comte, 2; Hornu, 4; Ninove, 3; Audenarde, 1.

Incomplete returns during the same period show the continued presence of small-pox, diphtheria and croup, scarlet-fever and typhoid-fever in Rome; and the special prevalence of these and other infectious diseases in Madrid, where deaths reported from them for the month of February were, from small-pox, 58; diphtheria and croup, 53; typhus and typhoid-fevers, 18; measles, 10; whooping-cough, 7; and the death-rate was 40.4.

From Surgeon-General Hamilton's Abstract of Sanitary Re-

ports received through the Department of State, April 13th–May 11th :

CHOLERA.—*Catania*, Italy, 4031 deaths were registered during the year 1887, including 679 from cholera.

Buenos Ayres, 12,894 deaths were registered during the year 1887, including 606 from cholera ; 26 per cent of the entire mortality was from zymotic diseases.

Callao.—The U. S. Consul, April 3d, 1888, states that " the last report from the Peruvian medical representative in Chili regarding the progress of the cholera in that republic is dated March 23d last, and is as follows : ' Santiago.—No new cases ; deaths, 2 ; 17 sick in hospital. Another lazaretto closed. Valparaiso.—Seven new cases ; 1 death ; in hospital, 34. Ovalle, Viculla, few cases. At Serena it has disappeared. Lazaretto at Concepcion closed. Declining at Lota and Coronel.' This information is the most reassuring that we have received. The public health at Lima and this port continues to be satisfactory, but interdiction of vessels from Chili is still maintained. April 13th : The latest cable reports regarding cholera in Chili from the medical representative of this Government are very satisfactory. Under date of the 11th inst. he states that ' at Valparaiso the disease is officially declared to have disappeared ;' at Santiago ' only 2 patients in hospital, and the last lazaretto was to be closed on the 11th ; at Copiapo, 8 cases.' The authorities here will doubtless follow the precedent established last year and lift the interdiction of vessels from Valparaiso after sixty days have elapsed from the date of the official declaration mentioned."

Calcutta.—Deaths reported from cholera during the five weeks ending March 24th, 271.

Singapore.—Of 329 deaths registered during the month of February, 1888, 3 were from cholera.

SMALL-POX.—Deaths reported as follows :

Buenos Ayres, during the year 1887, 1290 ; Havana, during the month of April, 55 ; Cienfuegos, during the four weeks ending April 16th, 39 ; Sagua Le Grande, during the two weeks ending March 31st, 8 ; Santiago de Cuba, during the week ending March 31st, " several cases of varioloid " were reported, and during the week ending April 7th, deaths from

small-pox, 2; Guayaquil, during the two weeks ending March 11th, deaths, 11.

NO SMALL-POX IN CANADA.

PROVINCIAL BOARD OF HEALTH, MONTREAL, April 16, 1888.

Editor of THE SANITARIAN, *New York.*

DEAR SIR: I see in THE SANITARIAN for the month of March (page 205) that Dr. E. T. Nelson has pronounced small-pox "as endemic in Canada"!!

I beg to state that we had not a single case of small-pox in this province since the epidemic of 1885–86, and to remark that it was then imported into Canada from Chicago.

Yours respectfully,

ELZÉAR PELLETIER, M.D., *Secretary.*

Indeed, the great epidemic of small-pox in Canada four years ago has had the effect of establishing a system of sanitary administration in that country which is not only likely to protect it in future, but which, it is to be hoped, will have the effect of stimulating vigor in the United States.

The Annual Report of the Grosse Isle Quarantine Station, by F. Monti-Zambert, M.D., F.R.C.S., Medical Superintendent, now before us, characterizes the new system of "Regulations Relating to Quarantine" which first went into effect there July 18th, 1887, with a degree of energy and efficiency eminently deserving public confidence in the practical efficiency of a well-conducted quarantine against the introduction of small-pox, cholera, and other infectious diseases.

"The admissions to the quarantine hospitals under the new system rose from 13 last year to 70 this season, with 6 deaths in quarantine. . . . Many of these cases were of scarlet-fever and measles. . . . Under the system heretofore in vogue, such cases were but too often carried past without the vessel stopping at all, and being still concealed and forwarded West, they became centres of infection, spreading sickness and death in every direction, from Quebec to the West. Under the new system now just inaugurated, all such cases can be landed and isolated at quarantine, and without any detrimental delay to vessels."

It is gratifying to notice that the Station is in process of being thoroughly equipped with the most improved apparatus for speedy disinfection by steam and other efficient means.

OBITUARY.

CORNELIUS REA AGNEW, M.D., died, at his residence in New York, April 18th, 1888, in the fifty-eighth year of his age, after an illness of only a few days' duration—a peritonitis understood to have originated as a typhlitis. He was born in New York, August 8th, 1830. He entered Columbia College at the early age of fifteen years, and graduated from that institution in 1849. He soon after began the study of medicine under Dr. J. Kearney Rogers, attended the regular course of lectures in the College of Physicians and Surgeons, and while so engaged became walker, and, after graduation in 1852, house surgeon. Two years after graduation he went to Houghton, a small town on Portage Lake, N. Y., where he practised his profession one year, and returned to New York. He was soon afterward appointed resident surgeon to the Eye and Ear Infirmary, and shortly thereafter went to Europe to complete his studies to comply with the conditions of his appointment, where he remained a year, most of the while in walking the hospitals of Dublin and Paris. On his return to New York he established himself as a general practitioner, but still held his position as surgeon to the Infirmary till April, 1864, when he resigned, to enter upon what he always considered the most important work of his life—the duties of United States Sanitary Commissioner—to which he was appointed, and of which he was one of the organizers. He was appointed Surgeon-General of the State of New York by Governor Morgan, in 1858, and, at the commencement of the Civil War, Medical Director of the State Volunteer Hospital, New York, in which he performed efficient service.

On the conclusion of his service as Sanitary Commissioner, he returned to his home and resumed practice in the specialties of eye and ear diseases, in which he had already become well known. In 1866, by request, he established in the College of Physicians and Surgeons an Ophthalmic Clinic, and

three years later was elected Clinical Professor of Diseases of the Eye and Ear, a position which he still held up to the time of his death. In 1868 he originated the Brooklyn Eye and Ear Hospital, and in 1869 the Manhattan Eye and Ear Hospital of New York.

Although one of the busiest of practitioners in the specialty of his choice, in which he ranked among the foremost, he was, notwithstanding, *au courant* in the whole field of medical progress, while he was also a talented and public-spirited citizen. He was one of the managers of the New York Hospital for the Insane at Poughkeepsie; one of, and subsequently President of the Board of Trustees of Public Schools in New York; one of the Trustees of Columbia College, and one of those chosen to organize the School of Mines; was secretary of the first society organized in New York for sanitary reform, and a member of the committee that prepared the first draft of the city health laws. "The Importance of Sanitary Science, and Some of the Relations of the Medical Profession to Education," was the subject of his Inaugural Address as Bresident of the Medical Society of the State of New York, in 1873, and the first paper published in THE SANITARIAN (Vol. I.).

It would be an easy matter to follow Dr. Agnew's tracks in numerous scientific organizations and public institutions, local, national, and international, in his devotion to the best interests of human welfare, never as a partisan—though by no means without positive opinions—but always as a source of leading thought. He was a man, in the highest and best sense, with a scholarly, thoughtful, and well-balanced mind, who never resorted to any unfair or illogical devices in the advocacy of his purposes, but enforced his thoughts with a fairness which always won for him respectful attention, on no matter what the subject of discussion, that rarely failed in gaining strength by his advocacy. And withal, the exemplariness of his character was such that, with the community, the medical profession, and his patients, as with his family, to know him was to esteem him and love him—he was a *good man.*

LITERARY NOTICES are unavoidably crowded out of this number on account of the Proceedings of the Ohio State Sanitary Association.

THE SANITARIAN.

JUNE, 1888.

NUMBER 223.

THE PROGRESS OF STATE MEDICINE.

ADDRESS DELIVERED AT THE THIRTY-NINTH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION, CINCINNATI, O., MAY 10TH, 1888.

By HENRY P. WALCOTT, M.D., of Cambridge, Mass.

Members of the American Medical Association:

WHEN a committee of this body invited me to deliver the address which Dr. Cabell felt himself unable to undertake, I accepted the invitation with much hesitation, well aware that, in attempting to fill the place which all had hoped to see occupied by the honored head of our first—unfortunately, perhaps, our last—national health organization, I should fall far below your proper expectations.

Mingled with this natural reluctance is also the knowledge that I have not the oratorical skill to repeat in any new or attractive manner those general statements as to the claims of hygiene and State preventive medicine upon the public and our profession which have been so often and so eloquently brought to your attention.

Neither am I quite willing to limit myself to an attempt to describe the progress of public preventive medicine during the past year. But I shall assume that my text has been given me in the fact which is probably the reason for my invitation to occupy this most honorable place. I mean my connection with the State Board of Health of Massachusetts, now in the twentieth year of its existence.

This board has passed through experiences which are more or less true of every other State Board of Health in this

country—it has sometimes failed where success was due and has succeeded where defeat seemed inevitable. It has illustrated the various stages of progress in the attempt on the part of the State to prevent disease, and has also, at some periods in its history, suffered from the interference of politicians and self-seekers.

This story, interesting as it might be in Massachusetts, would be quite out of place here, were it not true that we also have a fairly kept record of our vital statistics from the year 1842 to the present time.

Therefore it has seemed to me that it would not be unprofitable, in this twentieth year of State preventive medicine, that I should attempt to answer some of the questions that may fairly be asked of those who have had a share in the public responsibility for the prevention of disease.

You will not need the assurance, I hope, that the example of my own State is used in no limited and provincial spirit. We have not hesitated to borrow from our brothers in other States and countries anything that offered the slightest promise of help in the unending struggle for the preservation of human life. We have relied upon their counsel and assistance, and have not been disappointed. On the other hand, the legislative act by which our board was established has served as a model for many of the organizations subsequently formed. Our interests have thus been common, our methods similar, and the results will be not much unlike.

Another reason for using this local experience lies in the fact that our restricted territory and comparatively large population have brought about conditions which, fortunately for the majority of the States of the Union, will remain in the distant future, but which, sooner or later, will come to all, and almost inevitably sooner than they are expected.

That these experiences can be submitted to no tribunal so competent to correctly interpret them as the medical profession is a proposition which scarcely needs an argument.

Although State Medicine, as the name implies, is the result of legislation in which our profession has little or no share, and legislation which, oftentimes, is not immediately suggested by medical men, still it is quite true that legislative bodies have rarely, if ever, acted upon measures concerning the pub-

lic health without some understanding of the views of our profession, expressed publicly in the hearings before appropriate committees of the legislative bodies, or privately in the more convincing interchanges of opinion between legislator and constituent. But while this is true in a general sense of the influence of the profession, it is not true that the best medical opinion receives the highest consideration, for it is not the loudest-voiced, and it is constitutionally unwilling to enter the field of politics.

It should be, then, one of the functions of great representative assemblies of the profession, such as this is, to give voice to the deliberate opinions of those who are the only competent critics of the failures or successes of State Medicine.

In the earlier days of sanitary reform great improvements in the general health of communities were brought about by public works for the protection of water supplies and the better drainage of cities; these were carried on under the direction of eminent engineers, who received, and properly, the praises due to their successful undertakings. But these very successes had to a certain extent misled the public, which was now inclined to believe that a water supply pure from ordinary contamination, a system of sewers that removed without offensive smells waste matters, were the beginning and end of sanitary regulation. The sanitary plumber, as he advertises himself, is another instance of the same tendency. While there is no question that something has been added to the security of human life, and much to its comfort, by the better planned and better constructed arrangements for our domestic conveniences, still it is true that the real question has been little advanced by all this—the question how the filth diseases, so-called, originate and how they are propagated. Many of them are found in connection with bad plumbing; some of them, also, where the plumbing appears to be perfect. The study of their origin and spread must remain in the hands of trained observers of the medical profession, for they alone can read the characters in which the evidence is recorded and assign to the various details their relative value. It is, therefore, essential that the relations between the health authorities, whether they exist in the form of boards or single commissioner, and the great body of the practitioners of medicine,

should be founded in confidence; for without these supports no executive sanitary power can long maintain itself, however firmly intrenched behind political influence.

I do not mean to say that there will not be seasons during which legislative bodies will seem to arrogate to themselves the special knowledge which belongs to our calling; but it will be observed that this happens only in the years of comparative good health and prosperity. Let disaster come; let any one of the great pestilences invade the land, and all will be changed. Powers will be conferred upon boards of health never dreamed of by the founders of the Republic, and appropriations of money made which would, if used in season, have averted many pestilences. Our rulers allow the dykes to be broken through and the whole country to be flooded. The labor of one man might have saved the dyke if applied in season; the toil and the lives of thousands may be the penalty for the neglect.

These great epidemics of contagious disease are treated by governments generally very much as our ancestors used their weapon-salve; the remedy was rubbed upon the weapon that inflicted the wound, and the patient was for the time an object of secondary importance.

Would it not be as reasonable, in this day, to establish a quarantine station at the entrance of a harbor and then to abandon all sanitary work in the threatened district, and to rely for protection on that alone which never has been and never will be, in the weakness of man, a sufficient safeguard?

Before leaving this branch of the subject I wish to call your attention for a moment to the anxieties so frequently shown by our national legislators as to the unconstitutionality of the sanitary legislation which has been from time to time demanded in the interest of the public health. It is, I presume, true that the words "public health" do not occur in the written Constitution of the United States, and they do not appear there for the simple reason that in the year 1787 men knew very little practically about the prevention of disease, their efforts to limit epidemics consisted in brutal and irrational systems of quarantine, which did not protect; and are now giving way to the humane and scientific methods of medical inspection, disinfection, at times detention on the

frontier, and prompt isolation within the country, of those suffering from communicable diseases.

Public hygiene, which lies at the foundation of modern civilized life, is almost literally a creation of the present day. In earlier times under the scourge of some startling inroad of disease, States and smaller communities had made occasional and spasmodic attempts to repress great epidemics—but a belief in the prevention of disease, as we understand these words, did not exist; and it is within the active life of men now living that this important branch of medicine has received its proper consideration. One of the first among the medical teachers of this country to direct attention to preventive medicine was Dr. Elisha Bartlett, sometime Professor of the Theory and Practice of Medicine in the Transylvania School of Medicine, in Kentucky, a man who exercised by his teachings and writings a great and sound influence throughout the country. In his essay on the Philosophy of Medical Science, published in 1844, he claims that the great work of the next and succeeding generations will be the best methods of preventing as well as curing disease.

The words of that great physician Dr. Samuel D. Gross, himself known and honored wherever the science or the art of surgery is recognized, show how fully this prediction has been realized. It seems to me singularly appropriate that the words should have been spoken upon the occasion of the dedication of a monument to the memory of Ephraim McDowell, who gave to the world that surgical operation which in the cure of disease has given more years to woman's life than any other:

"The great question of the day is not this operation or that; not ovariotomy or lithotomy, or a hip-joint amputation, which have reflected so much glory upon American medicine, but *preventive medicine*, the hygiene of our persons, our dwellings, our streets, in a word, our surroundings, whatever and wherever they may be, whether in city, town, hamlet or country. This is the great problem of the day, the question which you, as the representatives of the rising generation of physicians, should urge in season and out of season, upon the attention of your fellow-citizens—the question which above and beyond all others should engage your most serious thoughts and elicit your most earnest co-operation."

Many of our law-makers have discovered, I believe, no other authority for sanitary legislation on the part of the General Government than that which is contained in the section of the Constitution which declares that Congress, among other functions, shall have power "to regulate commerce." There does not appear to be any clearly expressed provision in the above-named document for the appropriation of money to help exterminate contagious pleuro-pneumonia in cattle, and yet the forty-ninth Congress did appropriate $500,000 for that purpose, and wisely, I am sure we shall all say. I read, however, in this same section of the Constitution that Congress shall also have power to provide "for the general welfare of the United States."

In our own day we have seen national, State and local laws swept away by cholera and yellow-fever. Let us hope, then, that some ingenious law-maker may find in these words a sufficient authority for the expenditure of enough of the public money, at least, to secure some of those thorough investigations of preventable disease which have characterized the work of the Gesundheitsamt in Germany and the Local Government Board in England.

When it can be deliberately stated—as I believe the experience of the last ten years makes it possible for us to state—that improved methods of research, that the knowledge already gained, have made it almost certain that co-ordinated investigations properly encouraged and supported by such aid as only a great government can give, would lead to the discovery of the causes of yellow-fever and malarial-fever in the first place, and in the second, to rational methods of dealing with these most formidable scourges of the land in the way of prevention or of cure. Then, I say, it does seem in the highest degree absurd, that any form of government should deliberately deprive itself of the sanitary gains which contribute so directly to the preservation of "life, liberty and the pursuit of happiness."

The State Board of Health of Massachusetts was established by legislative action in 1869. Local boards of health, of not much efficiency, had existed from the beginning of the century. The State Board of Health entered at once upon its duties, which were advisory rather than executive. Under

the lead of wise men the public intelligence was quickened upon all the important sanitary questions to such a degree that the succeeding years brought to the board added executive power and larger appropriations. Seven thousand five hundred dollars were appropriated for the work of the board in the earlier years; in the present year sixty thousand dollars are the conclusive evidence of the people's belief in the value of protective medicine, and this sum does not include the large sum spent upon the registration report.

After ten years of most successful administration it was thought advisable by the Legislature of the day to very widely extend the functions of the board by reorganization and the addition of the power of Commissioners in Lunacy and of the Supervision of the Public Charities. The burden proved too great, and after a few years the original organization was restored with enlarged powers.

The right of the people to pure air, soil, water, and food are recognized by the laws of the commonwealth, and various statutes have been passed to secure these results and to prevent their infringement. The board is charged to some extent with the duty of enforcing these rights and preventing and punishing any violation of them, having for this purpose power co-ordinate with that of the local boards of health.

The business of investigating and gathering information as to any matter pertaining to the public health and of diffusing such information among the people is also included in its functions.

Among the matters of which it thus takes cognizance are the causes and prevention of infectious diseases. For this purpose co-ordinate powers with local boards of health are given to the board: the suppression of nuisances, including the regulation of noxious and offensive trades; the collection and diffusion of information relative to industrial hygiene, or the effects of different occupations, industries, and domestic pursuits upon people at various ages and under various conditions of life; the hygiene of schools, school buildings, and public institutions; the examination and investigation of public water supplies and public ice supplies, and the prevention of their pollution; the investigation of drainage and sewerage plans or systems so far as they relate to the public health; the dis-

posal and transportation of the dead; the inspection of food, drugs, and other articles affecting the public health; inquiries relative to the amount of intemperance from the use of stimulants and narcotics, and the remedies therefor; investigations as to the infectious diseases of animals so far as they affect man; the editing of the registration report of the State.

What effect has all this had upon the health of the people as shown by the mortality rate? For that is the only trustworthy standard, under our present means of registration, by which to determine the effects of measures taken for the prevention of disease. Without the assistance of well-conceived and carefully executed tables of vital statistics, communities are liable to the most erroneous impressions as to the actual effect of their surroundings upon the general health. Hence, our legislation in sanitary matters is in constant danger of becoming the reflex merely of vague rumors, hasty and incorrectly formed conclusions, or statements based solely on commercial and interested motives, unless it is distinctly understood that the duration of human life, the diseases by which it is cut short, and the preventable or inevitable character of the disease, so far as we now understand these qualities, are things which can be determined by intelligent and continuous investigation by experts, and should be no more the subject of guesswork than the truths of mathematics or the facts of chemistry.

Inasmuch as the task which I have taken upon myself is the proof of the value of preventive medicine, let us take not the mortality rate as a whole, but the rates from certain specified diseases which are admitted to be preventable and controllable by means of vaccination, isolation and disinfection, and suitable sanitary precautions.

Let us then compare these rates in successive years not only with each other, but also with the rates of those diseases in respect to which we possess no well-recognized powers of prevention.

This comparison shall be made during the period of the existence of our State Board of Health; not with the presumption that statute regulation, either in the hands of a State or municipal board of health, deserves all the credit of the improvement obtained.

During this period there has been an active and intelligent

interest in all sanitary questions, steps have been taken on all sides for procuring purer water supplies, better drainage, food and drugs free from adulteration ; tenement-houses have been much improved, sometimes by private undertaking, and oftentimes under the compulsion of the law. But in all these movements the influence of the sanitarian has been predominant, and the improvement in the health of the people is regarded as the only just standard for the measure of our success.

When regard is had to the fact that Massachusetts is one of the oldest settlements in the country and, with the exception of Rhode Island, the most densely populated State in the Union, it would not be surprising to find there a relatively high death-rate. This would be true even if the conditions which favor health there were equal to those found in other States.

The average death-rate for the thirty-six years 1851–1886 was 19.40 per 1000 living ; the lowest death-rate in this period was 16.99, in the year 1867 ; the highest death-rate that of 1872, being 22.85 per 1000. It was 18.38 per 1000 in 1869, and 18.85 in the last registration year, 1886. So far as these figures go, we have no changes of consequence.

But if we turn to the general classification of causes of disease into zymotic, constitutional, local, developmental, and violent, we find that there has been an almost constant decrease in the class of zymotic diseases during the period now under consideration.

PERCENTAGE OF CAUSES OF DEATHS BY CLASSES.

Years.	CLASSES.				
	Zymotic.	Constitutional.	Local.	Developmental.	Violent Deaths.
1870.....	25.6	26.6	28.1	15.6	4.1
1875.....	28.6	24.3	31.8	11.2	4.1
1880.....	24.5	23.7	38.0	10.1	3.7
1885.....	19.0	23.7	42.7	10.7	3.9

The years taken are census years.

The changes in the class of *constitutional* diseases have not

been so marked as in those of the zymotic class, although the tendency appears to be constant in the direction of a decrease. In the class of local diseases there has been a decided increase, from 28.1 in 1870 to 42.7 in 1885.

In the class of deaths from developmental causes the changes in the last three census years are insignificant. As this class contains deaths from teething and old age, it is to be expected that more accurate diagnosis will diminish its relative importance.

The percentage of violent deaths remains throughout essentially unchanged.

If we arrange the percentages of causes of death from zymotic diseases in two columns of ten years each, we shall find in the first decade, from 1867 to 1876, the average of these percentages to be 27.94; in the second decade, 1877–1886, the average has fallen to 22.4.

Let us examine more carefully the diseases which we have a reasonable hope of preventing by appropriate sanitary regulations:

We shall find at the head of the list a disease which we can with certainty limit, if not abolish. As we pass down the list we shall come to diseases which are more and more dependent upon the special treatment of a physician or surgeon, and can be but slightly, if at all, affected by the surroundings which the public officer of health can control.

It seems, however, to be true that, with each succeeding year, a larger and larger number of these are found to be the result of influences that can be removed.

For the first time in the registration history of the State a year has passed—1886—without the record of a single death from small-pox, and this notwithstanding the fact that we are in continual communication with countries where the protection of vaccination is not so generally given as it should be, and one of our chief industries, the manufacture of paper, involves the use of materials which always carry with them the possibility of the presence of the contagion of this most persistent disease. Many years of comparative immunity from small-pox had led to a disregard of the stringent laws for compulsory vaccination, and the State paid the usual penalty in 1872 and 1873, the mortality in the former of these years

reaching 2.9 per cent of the deaths from all causes, with 1029 deaths from small-pox. The attention of the authorities was aroused, existing legislation was rigidly enforced, and additional powers, where found necessary, were obtained, and there has been no year since when the percentage of deaths from this cause to deaths from all causes has reached fourteen hundredths (.14) of one per cent.

Typhoid-fever has, upon the whole, diminished both relatively and absolutely. In 1886 the percentage of deaths from typhoid-fever to deaths from all causes was 2.15 ; in the year of greatest prevalence, within a period of twenty years—1872—the percentage of deaths from typhoid to deaths from all causes was 4.86, and the death-rate per 10,000 living was 11.1. The diminution in the death-rate from this disease has been especially marked in cities with new water supplies and good systems of sewers. The death-rate from this cause is substantially unchanged in the small country towns.

The death-rates from typhoid-fever per 10,000 living, in census years 1865–1885, have been for the State : 1865, 13.4 ; 1870, 9.1 ; 1875, 6.4 ; 1880, 4.9 ; 1885, 3.9.

Scarlet-fever has more than once astonished the medical world by a sudden assumption of great violence and fatality after many years of comparatively harmless prevalence. Graves has called the attention of the profession in a most instructive manner to the experience of Dublin, where from 1804, when an epidemic of great malignancy had come to an end, until 1834, the scarlet-fever that occurred was very mild. At the latter date the disease burst in upon the city with its old-time ferocity. It is therefore with some hesitation that I use the figures of the registration as to this disease. The record for thirty years shows a death-rate per 10,000 living reduced from 17.2 in 1857, to 1.7 in 1886. Though it is possible that we are only nearing the end of a series of benignant years, and that another may see the return of an epidemic over which we possess little power. Still, it is the belief of our most competent observers, that isolation and disinfection have had a sensible effect upon the spread of this disease.

Diphtheria first appeared in our registration in 1858, causing in that year eighteen deaths ; reached its highest degree of prevalence in 1877, and since that year has much diminished

in frequency, but has not again sunk to the low figures of the years 1870–1873, when it constituted less than 1 per cent of the deaths from all causes.

If in the present uncertainty of medical diagnosis with reference to croup and diphtheria, it is desirable to consider them together, and all deaths from croup are added to those resulting from diphtheria, we should not obtain conclusions essentially different from those above stated. An examination of our record shows that the reported deaths from croup are slowly and steadily falling in number, and that the two diseases rise and fall together in the scale of prevalence. It is probable, therefore, that a more accurate diagnosis will hereafter transfer to deaths from diphtheria many cases which would, in times past, have been assigned to croup.

The relation of diphtheria to the grosser forms of unsanitary conditions, is not yet clearly made out. There is also a probability that some of the lower animals are attacked by it.

The degree of its prevalence in Massachusetts in the United States census year 1880, was almost identical with the rate for the whole country. The general rate was 5039 out of 100,000 deaths from all causes; the rate in Massachusetts was 5010 to the 100,000. In England in 1880 the rate was only 532 per 100,000, which does not vary essentially from the rate of the ten years preceding.

In the city of Boston a notification to the Board of Health of all cases of diphtheria, as well as of certain other communicable diseases, is compulsory. The board in such cases causes a careful inspection of the premises to be made. In the year 1887, when 1049 cases, with 316 deaths, were reported, 927 houses were examined; 534 were found to be in defective sanitary condition; 393, on the contrary, were in good sanitary condition.

A rigid inspection of 900 houses taken at random in any city would, I think, not be unlikely to show nearly as large a number of houses that would fail to satisfy an examination which is very apt to start out with the determination to find some sanitary defect.

It is a communicable disease in a very marked degree, but does not appear to have any other relation to filth than this, that the absence of proper cleanliness, and the presence of the

material of contagion in the food, person or surroundings, are quite sure to go together. It may also be assumed to be probable that a number of mild cases of the disease always exist, and are the unsuspected vehicles of the contagion. We know this to be true of almost all the diseases of this class, and I think we have hitherto taken the probable existence of such cases too little into account.

The diarrhœal diseases, including diarrhœa, dysentery, cholera-infantum, cholera-morbus, and enteritis, have only changed place in the list as cholera-infantum has varied. Cholera-infantum, during the period of twenty years, has diminished, though the fall has not been regular; dividing the period of twenty years into two decades, the average of the first yields a death-rate from cholera infantum of 13.51 per 10,000 living; the second an average of 10.32 per 10,000.

Dysentery, which in the first half of this century has several times appeared in epidemics of great severity, has thus far in the second half been steadily diminishing in importance. The improvements in domestic water supplies appear to have had some influence upon this reduction in number, so far at least as the question has been studied in certain cities in the State. Only 243 deaths out of a total of 37,244 are assigned to this disease in 1886.

Malarial fevers caused in 1886 32 deaths, of which number 20, or 62.5 per cent, occurred in the five western counties, which have but 26 per cent of the population. Although serious epidemics have occurred in the eastern counties during the years 1884–86, they have thus far had little apparent effect upon the death-rate. Statistics of disease as well as those of mortality would be an additional index of very great value for the sanitary condition of a district. In the case of the disease now under consideration, they would be of unusual value, because portions of our State hitherto exempt have been invaded by malarial fevers, and yet the resulting mortality has been insignificant. We can only say that malarial fevers have increased beyond the increase in our population, and that this tender exotic in New England has unfortunately found some new conditions which favor its development.

The number of deaths from measles has been very variable through this period; this variability in mortality was more

noticeable in the last half than in the first half of the period. The average of the last half was also less than in the first half. The number of deaths has ranged from a minimum of 19 deaths in 1879, to 428 in 1872.

MORTALITY FROM PULMONARY CONSUMPTION, BY DECADES, 20 YEARS.

Years.	Deaths.	Death-rates per 10,000 of Population.	Years.	Deaths.	Death-rates per 10,000 of Population.
1867.....	4,362	32.5	1877.....	5,457	32.9
1868.....	4,437	32.2	1878.....	5,334	32.0
1869.....	4,659	32.8	1879.....	5,223	30.4
1870.....	5,003	34.3	1880.....	5,494	30.8
1871.....	5,070	33.9	1881.....	5,886	32.4
1872.....	5,556	36.2	1882.....	5,865	31.7
1873.....	5,556	35.3	1883.....	5,931	31.5
1874.....	5,284	32.8	1884.....	5,798	30.3
1875.....	5,738	34.7	1885.....	5,955	30.5
1876.....	5,327	32.2	1886.....	5,897	29.8
Average.....	5,099	33.7	Average.....	5,684	31.2

The number of deaths reported as due to consumption in 1886 was 5897. The percentage of deaths from this disease to deaths from all diseases was 15.83. Arranging the deaths from consumption in two periods, 1867–1876 and 1877–1886, the average of the second decade is found to be 2.5 per 10,000 persons living less than that of the first decade—that is to say, from 33.7 to 31.2. There has thus been an actual decrease in this disease, and more marked in the second decade than in the first.

Our registration report in its present form gives us no satisfactory answer to one of the most important questions that arises in the consideration of this disease. How often and under what conditions is the predisposition to consumption hereditary? It is, in the very nature of our life, unavoidable that every individual must at many times be exposed to the contagion of tuberculosis, and yet it is within every physician's experience that many members of families with very distinct histories of consumption in more than one generation do escape.

One of the most important and widely spread influences upon the origin and extension of consumption was announced by an honored President of this Association, also the father of State Medicine in Massachusetts—Dr. H. I. Bowditch—fortunately still living in vigorous old age, who, by his announcement and proof of the law of soil moisture and land drainage in their influence upon consumption, has turned the attention of the world to conditions which can be controlled.

Pneumonia has generally held the second place on our mortality lists, and has not diminished in relative frequency in recent years.

The total number of deaths reported as due to cancer in 1886 was 1104; the ratio of fatal cases among females to the whole number has increased as follows: 1881, 64.4; 1882, 64.9; 1883, 67.6; 1884, 66.6; 1885, 68.8; 1886, 69.7. If the statistics relative to cancer during twenty years are divided into two ten-year periods, with death-rates per 10,000 living, we shall find that there has been an increase with a certain degree of uniformity from 2.9 per 10,000 in 1867, to 5.6 in 1886, nearly double.

In England and Wales very much the same increase has been noted; the proportion of deaths from cancer has increased regularly from 2.7 per 10,000 in 1847, to 5.3 per 10,000 in 1882.

The number of deaths from the group of diseases attributed to the brain was 3844, which, though a little less than in 1885, was still larger than that of any other previous year.

The mortality-rates per 10,000 in the census years 1860, '65, '70, '75, '80, '85 were successively 12.06, 14.39, 14.35, 16.42, 17.0, and 20.01.

Deaths from alcoholism appear to have diminished in number, but it is confessed that the death-rate ascribed to intemperance directly is but an imperfect measure of the evils resulting from an excessive use of alcohol. Neither do the figures of the report convey any just idea of the actual or relative prevalence of the venereal diseases.

The fact that Bright's classical description of the diseased processes in the kidney known by his name was first published in 1837, and the slow progress made in the accurate

medical diagnosis of these diseases during the half century would lead us to expect in the diseases of the kidney an apparent marked increase from year to year.

It has been assumed also that the conditions of modern life have brought about a large actual increase, either from irregular and luxurious living or improper indulgences in food and drink. It has been claimed by some that the substances now frequently added to standard articles of food and drink for the purpose of adding to their keeping qualities or of fraudulently adulterating them have an injurious effect upon these organs.

The difficulties of answering these questions are much enhanced by the fact that in the early years of our legislation, when the real nature of diseases of the kidney was but imperfectly understood, very many of the deaths really due to this class were registered under the head of dropsy. Another large class would appear as diseases of uncertain seat, and diseases "not specified."

With these facts in mind, let us tabulate the deaths from Bright's disease and other diseases of the kidney in one column and the deaths from dropsy in a parallel column.

From an examination of the registration report of 1850, it appears that out of 16,606 deaths there were 18 under the heading of Bright's disease, a ratio of 1.1 to total mortality per 1000; from dropsy 416 deaths were recorded, a ratio to total mortality per 1000 of 25. In the years following the number of deaths in the first class has rapidly and steadily grown, reaching in 1886 a total of 1135 deaths, a ratio to total mortality per 1000 of 30.5; while the deaths from dropsy have as steadily and almost as rapidly decreased from a ratio of 25 per 1000 to 5.9 per 1000. If we now add the deaths from kidney diseases to the deaths from dropsy, we obtain a ratio to total mortality per 1000, beginning in 1850 with 26.1, and ending with 36.4 in 1886.

An increase startling enough to attract attention and require investigation, but still not of the alarming character attached to the apparently overwhelming increase of Bright's disease and the kindred affections.

We have no evidence in Massachusetts that any of the substances as used for the preservation or adulteration of food have a marked injurious effect upon the kidneys.

MORTALITY FROM BRIGHT'S DISEASE, NEPHRITIS, AND OTHER KIDNEY DISEASES, AND FROM DROPSY, AND RATIOS TO TOTAL MORTALITY.

Years.	Total Mortality.	Deaths from Bright's Disease, Nephritis, and other Kidney Diseases.	Ratio to Total Mortality per 1,000.	Deaths from Dropsy.	Ratio to Total Mortality per 1,000.	Totals.	Ratio to Total Mortality per 1,000.
1850	16,606	18	1.1	416	25.0	434	26.1
1851	18,934	27	1.4	390	20.6	417	22.0
1852	18,482	32	1.7	418	22.6	450	24.3
1853	20,301	35	1.7	465	22.9	500	24.6
1854	21,414	38	1.8	474	22.1	512	23.9
1855	20,798	56	2.7	501	24.1	557	26.8
1856	20,734	51	2.5	487	23.4	538	25.9
1857	21,280	45	2.1	512	24.1	557	26.2
1858	20,776	42	2.0	481	23.2	523	25.2
1859	20,976	56	2.7	522	24.9	578	27.6
1860	23,068	67	2.9	470	20.4	537	23.3
1861	24,085	91	3.7	440	18.3	531	22.0
1862	22,974	96	4.2	467	20.3	563	24.5
1863	27,751	111	4.0	533	19.2	644	23.2
1864	28,723	130	4.5	502	17.5	632	22 0
1865	26,152	173	6.6	492	18.8	665	25.4
1866	23,637	135	5.7	462	19.5	597	25.2
1867	22,772	161	7.1	421	18.5	582	25.6
1868	25,603	206	8.0	470	18.4	676	26.4
1869	26,054	239	9.2	458	17.6	697	26.8
1870	27,329	286	10.5	491	17.9	777	28.4
1871	27,943	370	13.2	527	18.9	897	32.1
1872	35,019	376	10.7	618	17.6	994	28.3
1873	33,912	460	13.5	545	16.1	1,005	29.6
1874	31,887	463	14.5	469	14.7	932	29.2
1875	34,978	509	14.5	474	13.6	983	28.1
1876	33,186	488	14.7	445	13.4	933	28.1
1877	31,342	535	17.1	412	13.1	947	30.2
1878	31,303	615	19.6	370	11.8	985	31.4
1879	31,801	693	21.8	380	11.9	1,073	33.7
1880	35,292	698	19.7	271	7.7	969	27.4
1881	36,458	825	22.6	292	8.0	1,117	30.6
1882	36,785	877	23.8	313	8.5	1,190	32.3
1883	37,748	959	25.4	296	7.8	1,255	33.2
1884	36,990	1,000	27.0	234	6.3	1,234	33.3
1885	38,094	1,088	28.6	244	6.4	1,332	35.0
1886	37,244	1,135	30.5	219	5 9	1,354	36.4

Another lesson may be extracted from these figures. It is this: that statistical nosologies, as well as laws for the protection of public health, are educational and founded upon the

learning of experts, and will inevitably break down if they get too far in advance of the common knowledge.

The figures also show that, in a sufficiently extended series of years, an explanation of an apparent discrepancy may sometimes be discovered.

This hurried glance at the registration tables will have shown this, I think: that in all the preventable diseases there has been a steady reduction, most marked in the case of smallpox —a disease that can only seriously affect a community through inexcusable neglect.

I will not weary the ears of this assembly by dilating upon a topic on which all health authorities are agreed: the necessity for compulsory vaccination and revaccination so long as the system is susceptible of the virus.

A single comparison will demonstrate the saving of life in consequence of better sanitary conditions established by the authority of a board of health.

Probably no single instance of surgical interference in a disease inevitably leading to early death has attracted more attention, has deserved more admiration, or has added so many years to human life as the operation of ovariotomy.

The largest number of deaths in any one year in Massachusetts from ovarian dropsy was 51. We will assume that all of these lives might have been saved by ovariotomy.

Let me take now the city of Somerville, a suburb of Boston, with 29,971 inhabitants by census of 1885, with natural conditions of soil of varied character—partly favorable, partly unfavorable; with a mixed population almost wholly occupied with business, the trades and day labor. It has had an energetic and intelligent Board of Health, who have used the large powers conferred by our statutes wisely. They have a system of compulsory notification of the communicable diseases, rigidly enforced; they practise, so far as possible, isolation and disinfection. During their active administration and almost wholly in consequence of it, as I believe, the death-rate of the city has been reduced as follows: The Board of Health entered upon its work in 1878.

In 1875, a census year, the death-rate was 22.86; in 1880, 17.1; in 1885, also a census year, 16.68.

The improvements are more marked even when certain districts of the city are separately examined.

But this examination is scarcely necessary to prove that the interference of a public health authority, by such sanitary regulations as we can now enforce, has saved more lives in a community of 30,000 people, in a single year, than could have been restored to health, in this same period, in a State of nearly 2,000,000 persons, by an operation justly regarded as one of the greatest triumphs of surgery.

It may be objected that, with all this apparent diminution in the mortality from selected diseases, there has still been no reduction in the general death-rate, so far, at least, as the figures of the report are to be taken as evidence.

It is unfortunately true that our reports in the earlier years had a less degree of accuracy than they now have; that deaths were not so generally reported then as now. The records of the year 1855 were carefully examined for the purpose of determining the completeness of the enumeration of the deaths in that year. It was estimated by a competent authority, as the result of the examination, that not far from 16 per cent of the deaths in that year escaped registration.

It is now believed confidently that this deficiency does not exceed 2 per cent, and the registration by means of burial permits has been made much more certain.

Apart from fluctuations in the returns of deaths to the registration offices, there are reasons for believing that some of the conditions are not now so favorable to health as they have been. The proportion of the population engaged in factories has steadily and rapidly increased. Larger numbers of the people, absolutely and relatively, live in cities, subject to the unsanitary influences that prevail there.

In 1875 63 per cent of the inhabitants of the State lived in cities and towns of more than 5000 inhabitants. In 1885 the proportion had risen to 73 per cent. There has also been a large addition to the native and therefore hardier population, of immigrants from foreign countries, whose adaptability to our climate and conditions of life is still uncertain.

Too great expectations seem to have been raised, also, by the very brilliant results of sanitary works in the older countries. Men have to deal there with all the evils incident to sanitary neglect that had lasted for centuries, and in great cities at that. Here, on the other hand, the cities have con-

tained a relatively smaller part of the population, and there has not been the same opportunity given for obtaining a result so striking as the reduction in the death-rate of London, for instance, from the high figures at the beginning of the century to those of to-day when she is the healthiest very large city in the world.

It may be of interest, in this connection, to call your attention to some of the diseases which have attracted general attention, and perhaps excited more interest in the public than all other causes of death combined.

In forty-five years and eight months ending December 31st, 1886, there appear to have been registered 1,163,571 deaths.

Small-pox has killed 5572 in this period and has given rise to more legislation than any other single disease, and is the one most easily controlled. One provision of law is the beginning and end of its regulation—and that is compulsory vaccination and revaccination.

Scarlatina has destroyed 37,666 lives, permanently impaired the value of a large but unknown number, and the attempt to prevent it by sanitary regulation belongs to recent years.

Typhoid-fever has been fatal to 45,871 human beings, generally in the prime of life. With an origin almost always in fæcal pollution, it becomes epidemic whenever that pollution reaches a water supply or food, especially milk. The general conditions which sustain this disease in its endemic form, and favor its epidemic spread, are the same which produce general unhealthiness.

It has been well said that an epidemic of typhoid-fever is a sanitary crime and should be punished as such. But the peculiar history of this disease has had but little influence on legislation in this country.

Epidemic cholera, the most persuasive apostle of sanitation that has been permitted to land on these shores, has destroyed from 1832 to this year not more than 2000 lives. In no one year, excepting 1849, the year of greatest prevalence, has it proved so fatal as scarlet-fever, croup, typhoid-fever, dysentery, pneumonia, whooping-cough, cancer or apoplexy; and even in 1849 the deaths from cholera did not vary much from the quarter part only of those from consumption.

Hydrophobia is represented by 72 deaths. More than half

of these occurred in the four years 1876–79. There has been no death from it since 1881.

Thirteen deaths from yellow-fever have not been considered of enough consequence to be given a place in the general summary. They occurred at the quarantine station in Boston and did not, perhaps, recall to any public health officer's mind the fact that about the beginning of this century yellow-fever had in more than one year been a pestilence in the city itself.

Our experience in State preventive medicine has proved this: that while great good can be done to any community by the establishment of a board of health, whose functions are largely those of instruction and advice, it is certain that, sooner or later, the people will place in the hands of those capable of exercising such powers the machinery for making that advice effectual. And this has happened with regard to every subject which has been successively made an object of inquiry. There is now ample authority for the control of public water supplies and systems of sewerage; sufficient legislation to punish and prevent the adulteration of food and drugs.

One of the most encouraging signs is the more intelligent view taken by the public of the questions to which self-interest seeks to attach a sanitary significance.

Perhaps the much-vexed question of oleomargarine may be taken as an instance of this. We have in this substance a legitimate commercial product which, when properly manufactured, is a safe and useful addition to our food supply. It can be so made and is so made. When sold as natural butter it becomes an impudent fraud and should be punished as such. But it is no more a matter of concern to sanitarians than the proper making of butter itself is, and some of our legislative bodies appear to so regard it.

It has been well said by one of the most eminent of the executive officers of health, Dr. Russell, of Glasgow, that "nothing is more conspicuous than the helplessness of the individual under the conditions of civilized life to secure the physical basis of health."

How can any single individual in a crowded city make any successful effort to improve, or even to ascertain the quality of the public water supply upon which he is exclusively de-

pendent? What can he do to secure a sufficiently prompt and safe removal of the waste materials of his daily life? How can he analyze the ingeniously sophisticated articles of food or medicine which may represent the ingenious employment of all the scientific skill that selfish capital can purchase? How vain it would be for him to attempt to prevent the crowding of the city, or the contamination of the air which he is obliged to breathe. Lastly, how can he recognize the presence of communicable disease, and recognizing, keep it at a distance?

There is no help but in co-operation on the most extended scale possible, individual, municipal, State and national. The individual must be compelled to give up his liberty to injure his neighbor. The great city must be restrained from converting the stream that flows past it into a sewer that shall poison the small villages that cluster about its banks lower down in its course. The country farmhouse must no longer, when a case of enteric fever occurs there, be a menace to the water that supplies a thousand city houses. No State should permit its own causes of disease, whatever they are, persons or things, to be transported into another State, nor pollute the common water supply. Lastly, the General Government should take cognizance of those causes of disease which can be controlled by no other power, or which are so general that the responsibility for them is national, or so overwhelming in their ravages that smaller political bodies have lost the power, if not the will, to protect the people.

Voluntary association on the part of persons, towns, States, or nations even, will never establish a sufficient safeguard when one dishonest or ignorant associate has it in his power to nullify all the effects of a neighbor's spirit of self-sacrifice and restraint.

Epidemic disease is an evil that cannot be left to work out its own cure; it widens its circle too rapidly, and the time is long past when any quarantine, using the word in its older sense, would be sufficient to restrain a pestilence within the limits of the district whose sanitary crimes might have fairly deserved some punishment.

How, then, shall we organize for the protection of the public health?

For the individual, that he may not injure his neighbor through his own ignorance or that of his adviser, let the State give him some assurance that the legally used title of physician designates a person sufficiently qualified to give advice for the prevention and cure of disease—and a certainty, also, that the quack who steals the title shall be punished.

Establish by direct provision of State law, local health authorities for each well-defined unit in our various forms of local government—village, town, city or county. Place in the hands of these authorities the execution of the laws of the State and all local ordinances and regulations pertaining to the public health, impress upon them the duties of watching all those conditions which immediately affect the health of the people; water supply, sewerage, sanitary condition of school-houses and scholars, factories, tenement-houses and the markets, periodic inspection of the inhabitants to prevent the neglect of vaccination; house to house inspection at least annually. In brief, they should have all the powers which society assumes for protecting the public health.

To meet the possibility that some districts may not have intelligence enough to appreciate, or that powerful commercial or other interests may interfere with, these laws, there should be a State authority with ample powers.

This would be called upon for the purpose of harmonizing the action of the various local boards, where the interests of various localities were involved. It should have co-ordinate power with all local boards in cases of communicable disease, in order that its action may be prompt and salutary. It should be enabled to carry on scientific investigations as to the causes of disease, to suppress noxious and offensive trades, as it will often happen that some great industry will possess in a community an influence sufficient to control the local board of health. This condition did in fact exist in Massachusetts, and no action of our State Board of Health in its earlier years was more heartily commended than that which transformed a town pestilent and disgusting from some fifty slaughter-houses into an attractive suburb of Boston. The business of slaughtering and rendering is now, in consequence of the action of the board, carried on in an abattoir entirely without offence.

This authority should also have the supervision of the laws for the prevention of the adulteration of food and drugs.

It should have the general oversight of the public water supplies.

It should have charge of the registration of vital statistics, and of the investigations of the diseases of animals so far as they affect the health of man.

The educational element should be always present in the work of the State and local boards of health; and as in all other affairs of life the value of the lesson will stand generally in direct relation to the cost of it. The person who receives the benefit of a sanitary improvement should pay, if able to do so, a part, at least, of the cost, and should never be permitted to lose a sense of the obligation of preventing the spread to his neighbor of unsanitary conditions of his own making.

All the arguments that have been used for the existence of State health authorities are also available, it seems to me, for the creation and support of some organization for the protection of the public health in connection with the general Government. I think that the medical profession is agreed that no power less than that of the national Government will be sufficient to prevent the introduction of disease from abroad, or control its transport from State to State. There is, of course, a question as to what form that central authority should take and how extensive should be its power.

The well-being of the country, to use the language of the Constitution, should imply that we must know all that can be known about those diseases and causes of disease which may affect the whole country.

Although the actual epidemic prevalence of disease of grave and frequently fatal character may be limited to certain districts, still the disturbance of commerce and the ordinary relations of life will extend to large sections of the whole country. Therefore the national health authority should have the power and the means necessary for a thorough investigation of the communicable and epidemic diseases and of the best means of preventing their spread. These investigations need not be limited to this country; in fact, it is quite evident that several of the most important diseases of this class must be also studied outside of the country—yellow-fever, for instance.

The general Government should also make available for use

in all parts of the land the information from foreign countries, as to the prevalence there of contagious and epidemic diseases. Not simply such communications as may be made by consular officers; for these as a whole have probably no great scientific value; but that great mass of information which through one channel or another reaches Washington.

To this should be added the statistics of mortality and disease already published by very many boards of health throughout the land, and not now readily available for use, except by difficult and tedious search through many documents accessible to few.

In connection with this statistical work would naturally be associated some arrangement for the prompt receipt of information from all sections of the existence of dangerous communicable diseases; for the purpose of warning from a central office all interested communities. A voluntary system of notification, established by the National Conference of the State boards of health, has proved of much service, notwithstanding the fact that some of the great States have abstained from giving this information in a useful manner. But the usefulness of this method of communication has been seriously limited by the want of a central office with comparatively simple system for sending prompt advice in any required direction.

Not the least of the very many claims of the National Board of Health upon the medical profession was its attempt to secure uniform systems of registration and vital statistics, and a nosology adapted to the changed views now entertained as to the nature of many diseases. This work should be taken up again and carried on, if necessary, by liberal appropriations, for the purpose of encouraging and assisting everywhere a continuous registration of vital statistics in suitable manner.

Dr. Billings, the wise and experienced officer in charge of the Mortality and Vital Statistics of the 10th Census, says:

"But, as the United States has no system of registration of vital statistics, such as is relied upon by all other civilized nations, for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining even an approximate estimate of birth and death rates of much the larger part of the country, which is entirely

unprovided with any satisfactory system of State and municipal registration ; and the data which the census gives, imperfect as they are, are the only ones by which we can compare the healthfulness of this with that of other countries, or can ascertain, even approximately, the relative salubrity or liability to particular forms of disease of different parts of our own territory." And again, "Nothing pays better than good book-keeping in national affairs, and in no part of a nation's work is good book-keeping more useful than in keeping records of the life and health of its people."

The most troublesome point in the whole inquiry remains. How far should the general Government enter into the management of quarantine?

Though I come from a State which has never asked the assistance of the authorities at Washington during any pestilence within her own border, and is not likely to do so in the future, and is at the same time fortunate enough not to have felt for three quarters of a century the terrors of the pestilence which has wrought such havoc in other States, with all this, I say that it seems to me the duty of the whole country, through the national authorities, to assist those communities which are too weak to help themselves and to undertake the health functions of local government for those too ignorant to know their remedies.

A satisfactory settlement of the question as to the power to be bestowed on the national authority depends, it seems to me, very much upon the form of the organization. If that of a board should be selected with an adequate representation of the separate States, there would then seem to be no serious objection to the bestowal upon this board of a direct control of quarantine. The points in dispute between the general Government and the States would appear to be safe in the hands of a board of national authority and directly representative of the States. It is quite probable that such a board would be cumbersome in form and not altogether easy to control—which is far from being an unmixed evil—but there are many contrivances by which a large board can delegate its powers to an executive committee during the intervals between the general meetings—meetings which need not be frequent. I can easily see, however, that this question is one for the lawmaker rather than our profession.

The only alternative seems to be a single officer at the head of a bureau in connection with some one of the departments at Washington—an officer not charged with great executive powers, who shall have, so far as it is possible, unlimited authority to investigate, by himself or by competent experts, the questions which directly relate to protective medicine. He should be at the head of all the current medical statistical work of the Government, with the exception of that of the public services. He should be in constant and harmonious relations with the scattered health authorities of the land and should be permitted to co-operate with them in sanitary work. He should be subjected to the distractions of no other service —neither of the Army, of the Navy, nor of the Marine Hospital Service. The vast dimensions to which State medicine has already grown, the apparently unlimited field for future extension, make it evident that nothing less than all the thought and all the working hours of the best man are not too much to be devoted to the supervision alone of the investigations which ought to be made not in one year of epidemic panic, but through all years.

The very manifest advantage to this officer of a board of advice could and would, in the very nature of things, be afforded by some representative of the State boards of health, quite similar, perhaps, to that now existing in the National Conference of State Boards. The need of early and confidential intercourse with these intelligent, active, and responsible bodies would suggest itself at once to the sagacity of any man who would be likely to hold this important office.

I believe that both the Department of Agriculture and the Bureau of Education have from time to time called to their aid representatives of the agricultural and educational interests of the whole country.

Of the sanitary investigations carried on by the authorities at Washington, with the exception of those under the direction of the National Board of Health, it is not possible to speak with much satisfaction. Not that the scientific men who conducted them were not entirely competent; it would have been difficult to have found men as well qualified as many of them have been. But it was very difficult in a year of health to secure the necessary action authorizing investiga-

tions of diseases that might at any time enter our country, and there is every probability that it will be equally difficult to secure the means of continuing the work.

Dr. Shakespeare was sent abroad in 1885 to make investigations of Asiatic cholera, then raging in Southern Europe. Beyond a few brief notices in the medical journals, one State board of health at least knows nothing, through any official information through any department at Washington, of the results of the inquiry. As the board of health alluded to is charged with the co-ordinate responsibility of watching the second largest port of entry in the Union—which has a more frequent communication with cholera-infected ports than any other, except New York—the failure to communicate valuable knowledge is inexcusable.

Again, in 1885, at the Washington meeting of the American Public Health Association, as well as at the meeting of the National Conference of Boards of Health, measures were taken for bringing to the attention of Congress some of the alleged facts in regard to the preventive inoculations in yellow-fever practice in Mexico, by Carmona, in Brazil, by Freire. Congress was requested to appoint a committee of experts to visit these countries and ascertain the truth of the statements made. Notwithstanding the apparent willingness of the authorities to grant the petition, the inevitable delay attendant upon national legislation prevented action until the summer of 1887, when the appointment of a single expert was authorized. The President, with great promptness, appointed an expert of the best qualifications, and Dr. Sternberg made a journey to Brazil and subsequently to Mexico. The year does not appear to have been so favorable for his purpose of studying the subject during the general prevalence of the disease as one of the preceding years would have been. Nor under his rigidly drawn instructions does he seem to have had all the advantages that would have accrued to an investigation less controlled by precise orders.

Unfortunately, the evidence submitted by Drs. Carmona and Freire appears to have been entirely insufficient to justify the claims made by them of the discovery of the yellow-fever germ, nor has a prophylaxis of yellow-fever by their inoculations been yet demonstrated.

It is a disappointment that we have not reached the result, that seems only just beyond our grasp; these claims, however, had been advanced so confidently by men holding honorable positions; inoculations had been made on so extensive a scale, that a formal examination had become a necessity. Dr. Sternberg's investigations are worth all the money that has been spent upon them. The way has been cleared for an exhaustive examination of this most virulent of important pests—an inquiry that should have no limit of time, short of the discovery of a sufficient cause, and if possible, of a preventive, even if an expenditure of money be required only less than the number of dollars that inadequately measure the country's losses and sufferings under this scourge.

It would be a satisfaction to all of us, I am sure, if Dr. Sternberg is enabled to complete the work so faithfully and intelligently prosecuted from the Havana investigation of 1879 to the present day.

But it must be regarded as a misfortune that scientific work of this sort should not be continuous and free from the irksome burden of limited time and meagre appropriations.

I approach the conclusion of this possibly wearisome repetition of commonplaces with some hesitation, for I wish to say a few words about the National Board of Health, still by Act of Congress in legal existence, by neglect of Congress in a state of hopeless lethargy. This board entered upon its work with every promise of success—the members of it were the best our profession could offer—the contributions to public hygiene, both by the services of its members and the labors of its experts, have their due and honored place among the records of such work the world over.

It demonstrated for the first time in this country, I venture to say, that local, State, and national health authorities could profitably and harmoniously unite in suppressing an epidemic of yellow-fever, and preventing its spread from State to State; and that under the influence of an impartially vigilant sanitary inspection and treatment, trade and commerce need not materially suffer. Yet all this has not saved it from practical extinction. Mistakes were probably committed, but they are trivial as compared to the merits of the board. I feel forced, for my own part, to the conclusion that its organic

form—quite distinct from that of a body of such powers with which I am acquainted, and unlike anything in our own national Government—must explain the failure to survive the unjustifiable attacks made upon it.

The presence upon the board of representatives of the Army, Navy, and Marine Hospital Service, however conspicuous may have been the attainments of their respective representatives, was not advantageous. They represented interests which ordinarily are of far less consequence than those of New York, Chicago, New Orleans, or San Francisco.

It would not be possible, I think, to select seven men—that being the number of the appointed members of the board—who should adequately represent the various divisions of the country. The States are not accustomed to a representation at the hands of other States, and the State not directly represented will find it difficult to understand the principle of selection.

The great States of Ohio and Pennsylvania have not been directly represented on the existing board.

Is it well to wait until a new outbreak of yellow-fever or the landing of cholera gives us legislation, founded only in the weakness of fear?

I cannot but think that it is better to have the substance of things, whether it comes in the form of Bureau of Health or Board of Health provided only that some of the great resources of the nation shall be turned to the protection of that property which is at least as valuable as the cotton fabrics of a Massachusetts mill or the wool of Ohio sheep. I mean the protection of that greatest property of all—human life.—*Journal of the American Medical Association.*

DIPHTHERIA'S DEADLY CONTAGION.—The *Medical Register* reports the case of an Ohio physician, who brought home for microscopic examination a portion of the throat membrane of a diphtheria victim, and permitted his children to look at it under a glass cover. Shortly after his entire family was stricken with diphtheria, and since two of the children and himself have died. Five children are yet down with the disease and are in a critical condition.

SHOULD NOT THE NATIONAL GOVERNMENT DEFEND OUR PORTS AGAINST THE NATIONAL ENEMY, CONTAGIOUS DISEASE?

READ BEFORE THE SECTION ON STATE MEDICINE OF THE AMERICAN MEDICAL ASSOCIATION, CINCINNATI, O., MAY 8TH, 1888.

By BENJAMIN LEE, A.M., M.D., Ph.D., of Philadelphia, Secretary of the State Board of Health of Pennsylvania.

To ask this question ought to be to answer it. To one who views it from the broad standpoint of a humanitarian nationalism, it would seem that there can be but one response, and that an affirmative one. The only argument which has been adduced against it is that the power of enforcing quarantine is a police power, and as such reserved by the Constitution to the several sovereign States. I confess myself unable to find any such reservation. On the contrary, Section 8 of Article I declares that "Congress shall have power to provide" not only "for the common defence," but for the "general welfare of the United States," "to regulate commerce with foreign nations," and "to make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the Government of the United States or in any department or officer thereof." More than this, the several States are expressly forbidden to "enter into any agreement or compact with a foreign power." Now, I am quite willing to grant that the enemies against which a "common defence" is thus guaranteed are the armies and navies of foreign nations, and not bacilli or cryptogams, although in a more highly advanced state of civilization a liberal interpretation might even admit these latter more formidable foes; but I ask:

First. What possible interest is there which more nearly concerns "the general welfare" than the protection of the entire nation from the introduction of pestilence from abroad?

Secondly. How is it possible to administer quarantine regulations without, to a greater or less extent, often to a very serious extent, interfering with the "commerce with foreign nations," from which the States are expressly bidden to keep hands off? and

Thirdly. In what way can such a reciprocal understanding be arrived at between the government of any State, still less of any city and foreign governments, as the rapidity and immensity of modern intercommunication makes absolutely essential, if the transportation of contagions is to be brought under control, when the said State and municipal governments are forbidden in so many words "to enter into any agreement or compact with a foreign power"?

Internal hygiene, the making of all laws which shall promote health, protect life, and prevent the transportation of contagion within the limits of each State, this certainly is a right reserved to each State by exclusion; but when it comes to the question of common defence against a common enemy from without, which more persistently and terribly than any other threatens the "general welfare," an appeal to the Constitution appears, both by analogy and by literal construction, by the letter as well as by the spirit, to lead to but one conclusion, that this latter power inheres in the general Government.

This question has, however, been practically decided by Congress in placing a fund at the disposal of the President, to be used at his discretion in taking measures to prevent the introduction of contagious diseases in especial emergencies and in assigning to a subordinate bureau of the Treasury Department the duty of establishing quarantine stations at certain points under certain conditions and of requiring the consular representatives of the nation to report the progress of contagious diseases in foreign countries to that bureau.

We may, therefore, consider that objection as finally tabled, and proceed to discuss the question whether the national Government, having the right to assume control in this matter, is not in duty bound to exercise it. In considering this subject, I shall not scruple to avail myself of the admirable work already done, contained in the following papers—viz.: "Practical Recommendations for the Exclusion and Prevention of

Asiatic Cholera," an address delivered by Dr. John H. Rauch, Secretary Illinois State Board of Health, before the National Conference of State Boards of Health at St. Louis in October, 1884; "Coast Defences against Asiatic Cholera," a report of an Inspection of the Atlantic and Gulf Quarantines between the St. Lawrence and the Rio Grande; "Report of the Committee of the College of Physicians of Philadelphia, appointed to investigate the efficiency of our Quarantine arrangements for the exclusion of Cholera and other Epidemic Diseases," an editorial article from the *Medical News* of Philadelphia, November 5th, 1887; "An Address from a Special Committee of the College of Physicians of Philadelphia to the Medical Societies of the United States, concerning the dangers to which the country is exposed by the ineffectual methods of Quarantine at its ports, and in regard to the necessity of National Control of Maritime Quarantine;" "Report of the Committee on Epidemic Diseases" of the Senate of the United States.

If it should be found on investigation that under the system which leaves the management of quarantine to local authorities, whether State or civic, every quarantine station has been generally supplied with everything necessary in the way of extensive grounds, so situated as to make isolation easy and complete; of commodious buildings for the reception, detention, and observation of suspects, and well-arranged and ample hospitals for the treatment of the sick; of establishments and apparatus for the complete and rapid disinfection of both effects and vessels—we might conclude simply from a sanitarian standpoint that federal interference was uncalled for. If, on the other hand, we find that, except possibly in a single instance, not one of these conditions has been discovered to exist, we are forced to the conclusion that neglect of this duty on the part of the Government is longer inexcusable; and if, moreover, we find that in the mature opinion of some of the ablest sanitarians and physicians in the country, it is impossible, from the very nature of things, that these favorable conditions could invariably be presented under State and local management, such neglect becomes a folly and a crime. In reference to this last point Dr. Rauch says: "Under the national health organization there should be extended and perfected:

"Fourthly. The system of Refuge Stations projected by the National Board of Health. With two or three exceptions, no port in the United States has adequate facilities for the proper administration of quarantine. Such a system as was inaugurated by the National Board of Health, and which is the only quarantine contemplated in these remarks, involves the removal of an infected or suspected vessel out of the track of commerce; the segregation of her sick from the well; the proper care and shelter of both these classes; the necessary disinfection of infected cargo and the purification of the vessel; and the release of vessel, cargo, and persons, so soon as they have been rendered safe and free from the danger of communicating disease.

"This is very different from a mere quarantine of detention. It is the American quarantine of sanitation, a common-sense quarantine, which aims to prevent the introduction and extension of contagion, not by merely arresting it at a given point and there leaving sick and well at its mercy until, the susceptible material having become exhausted, no more cases of the given disease occur; but by removing the susceptible at once from its influence, and then destroying it and the conditions necessary for its existence by scientific methods of disinfection and purification.

"To do this, however, requires a quarantine plant and facilities far beyond the means of any but the largest ports, supported either by abundant quarantine fees or by adequate appropriations from the State or municipality. But cholera may obtain access at a small port as well as a large one, and hence the necessity for the Refuge Stations above indicated."

And later, in the same address: "Sooner or later the national Government will be compelled not only to assume supervision of exterior quarantines, but to provide for a permanent system of co-operation with State and local governments in the administration of interstate sanitation; in order, on the one hand, to prevent the introduction of exotic epidemic diseases and, on the other, to prevent their spread from State to State along the great international highways of travel and commerce. This is a national duty. It is one that the national Government only can adequately discharge, and its expense is, equitably, one which should be defrayed from the national Treasury."

The report of Dr. Rauch's tour of inspection is already a classic. It goes without saying that while he found much to commend in the devoted and painstaking attention of individual officers to quarantine duties, he discovered, with very few exceptions, an almost entire absence of all the essentials of a thoroughly equipped quarantine station. Commenting upon this, he says:

"During all this time, from the earliest date to the present, the control of quarantine has remained entirely under the jurisdiction of State and local authorities, except during the brief period in which the National Board of Health exercised its limited quarantine powers under the Act of 1878, and which expired in 1882. It is this absence of adequate national health authority and legislation and the fact that, in such absence, the maritime quarantines are controlled and administered by State and local authorities—resulting in diverse and frequently conflicting regulations and requirements, and, of necessity, in a tendency to limit precautions to their own individual interest, commercial as well as sanitary—which throw upon interior States the responsibility of fully informing themselves of the strength or weakness of these outposts, in order to know where to anticipate danger and how to make their own preparations to meet it.

"At its last session Congress appointed a commission to examine and report upon the measures necessary for the defence of our sea-coast against a foreign armed enemy, and a distinguished publicist and statesman, Mr. Tilden, has recently urged this as a paramount duty of the Government. Millions of dollars have already been expended for such defence, and millions more will probably be forthcoming to meet this possible contingency. But the assaults of foreign contagion are not a contingency. They are actual events, and during the past twenty years they have cost the country an aggregate loss of life only less than that of the great war immediately preceding. Every sanitarian and many of our leading statesmen know that this actual and ever-recurring loss is wholly and entirely preventable by the expenditure of a sum which sinks into utter insignificance before the millions which will be appropriated for the protection of our coasts against possible future danger.

"But thus far neither sanitarian nor statesman has been able to overcome the petty jealousies of individuals, communities, and of States themselves, so as to secure the legislation necessary to remedy even the present confusion."

Early last autumn two or more cholera-infected ships lay in New York Harbor while the disease was spreading with considerable rapidity among the passengers who had been disembarked upon Hoffman's Island for observation. Impressed with the gravity of the situation, the College of Physicians of Philadelphia, one of the most venerable and least aggressive of American Medical Societies, on the 5th of October, appointed a committee "To consider the present danger of the importation of cholera into this country and to secure concerted action among the medical societies of the land in urging upon the State and national authorities the adoption of a uniform and efficient system of quarantine for all exposed ports." This committee, consisting of Drs. J. C. Wilson, Chairman; E. O. Shakespeare, late United States Cholera Commissioner to Europe, and Dr. R. A. Cleemann, late member of the Philadelphia Board of Health, did its work thoroughly and well, and reported its results fearlessly and impartially.

It took up two main questions:

I. What are the requirements of an efficient quarantine against cholera?

II. To what extent do the existing arrangements at the ports of New York, Philadelphia, and Baltimore fulfil these requirements?

Their reply to the first of these questions, taken from an editorial in the *Medical News* of October 15th, sums up these requirements so completely and concisely that I make no apology for reproducing it in full:

"Measures of prevention, to give the greatest possible guarantee of success in extinguishing an incipient epidemic of cholera, should, in the first place, be based upon the most exact knowledge we possess of the cause, mode of attack, and manner of spread of the disease; and, in the second place, these measures should be intelligently, thoroughly, and rigidly enforced.

"What are the considerations involved in the first category? Probably nine tenths of intelligent and experienced physicians

all over the world, even including those of India, have for years admitted that there is most convincing proof that the active cause of the disease is a specific, material, living entity, of extremely minute size, endowed with the power of self-propagation, and of exceedingly rapid multiplication in enormous numbers; that among animals it naturally attacks man alone, assailing him only by way of the intestinal canal; that the evacuations from the bowels contain the active cause of the disease, and that when this agent in any manner—as through drinking water, milk, food, or the handling or washing of contaminated personal effects, etc.—reaches the intestines of another susceptible person, the disease may be thereby transmitted from the sick to the healthy; that the active agent exists in the dejecta of the lightest and most imperceptible, no less than the severest and most deadly forms of the disease, and is known to be transportable from place to place through the movements of man and his personal effects.

"Proceeding from this basis, logical deduction and common experience alike demonstrate the absolute necessity and efficiency of such measures of prevention as the following:

"(*a*) Speedy recognition and isolation of the sick; their proper treatment; absolute and rapid destruction of the infectious agent of the disease, not only in the dejecta and vomit, but also in clothing, bedding, and in or upon whatever else it finds a resting place.

"(*b*) The convalescents should remain isolated from the healthy so long as their stools possibly contain any of the infecting agent; before mingling again with the well they should be immersed in a disinfecting bath, and afterward be clothed from the skin outward with perfectly clean vestments, which cannot possibly contain any of the infectious material.

"(*c*) The dead should be well wrapped in cloth thoroughly saturated in a solution of corrosive sublimate, 1 to 500, and without delay, cortège, or lengthy ceremonial, buried near the place of death in a deep grave, remote as possible from water which may, under any circumstances, be used for drinking, washing, culinary, or other domestic purposes. (Cremation, of course, is by far the safest way of disposing of cholera cadavers.)

"(*d*) Those handling the sick or the dead should be careful

to disinfect their hands and soiled clothing at once, and especially before touching articles of food, drinking or culinary vessels.

"(*e*) In the case of maritime quarantine, the well should be disembarked and placed under observation in quarters spacious enough to avoid crowding, and so well appointed and furnished that none will suffer real hardships.

"(*f*) Once having reached the station, those under observation should be separated in groups of not more than twelve to twenty-four, and the various groups should, under no pretext, intermingle; the quarters for each group should afford stationary lavatories and water-closets in perfect working condition, adequate to the needs of the individuals constituting the group, and supplied with proper means of disinfection; there should be a bed raised above the floor, proper coverings and a chair for each member of the group, each person being required to use only his own bed; there should be a common table of sufficient size to seat around it all the members of the group, who should be served their meals from a central kitchen, and with table furniture belonging to the station and cleaned by the common kitchen scullions.

"(*g*) Drinking water, free from possible contamination and of the best quality, should be distributed in the quarters of each group, as it is needed, and in such a manner that it is received in drinking cups only; there should be no water buckets or other large vessels in which handkerchiefs, small vestments, children's diapers, etc., can be washed by the members of any group.

"(*h*) Immediately after being separated into groups in their respective quarters, every person under observation should be obliged to strip and get into a bath (a disinfecting one is preferable), and afterward be clothed with fresh, clean vestments from the skin outward. Every article of clothing previously worn should be taken away and properly disinfected.

"(*i*) Then all of the personal effects should be at once removed to a separate building, washed—if possible—and thoroughly disinfected, or if necessary destroyed. After disinfection they should be temporarily returned to the members of the groups, when occasion requires a further change of clothing.

"(*k*) Under no circumstances whatever should washing of clothing by those under observation be permitted. All used clothing should be first thoroughly disinfected (by boiling, when possible) and then should be cleansed, the disinfection and washing being done by a sufficiently trained and absolutely reliable corps of employés, supplied with adequate appliances.

"(*l*) All of those under observation should be mustered in their own quarters and be subjected to a close medical inspection, *while on their feet*, at least twice every day, in order to discover and isolate as soon as possible new cases which may develop; and, of course, the clothing and bedding of these new cases should be treated without delay in the manner already mentioned. In the meantime a watch should be set over the water-closets, for the purpose of discovering cases of diarrhœa, and, when discovered, such cases should be temporarily separated from the rest; they should receive judicial medical attention at once, and precautions should be taken as if they were undoubted, but mild, cases of cholera.

"(*m*) The quarters should be kept thoroughly clean, and every surface upon which infectious material could possibly be deposited, including the floors, should be washed with a strong disinfectant twice daily, and oftener when necessary; evacuations from the bowels should be passed into a strong disinfectant, the hopper of the closet should be then flushed, and finally drenched with a quantity of the same disinfectant.

"(*n*) For the proper attention to the sick, there should be two or more competent and experienced physicians, assisted by a sufficient corps of intelligent and efficient nurses, with hours of duty so arranged that a physician with a sufficient number of nurses be in constant attendance in the wards of the hospital.

"(*o*) For the prompt recognition and separation of new cases, their temporary medical attention, the proper treatment of discovered cases of diarrhœa or chlorine, and of other maladies, and the immediate correction of every insanitary practice or condition by constant, vigilant, and intelligent supervision, there should be at least two or more competent and experienced physicians, with hours of service so arranged that a physician is on duty night and day among those under

observation ; and he should have subject to his orders, at any and every moment, a sufficient and efficient corps of nurses and laborers to carry out properly and promptly his directions.

"(*p*) In order to prevent the intermingling of the various groups, to enforce obedience and order, and to make it absolutely impossible for the quarantined and their personal effects to have any communication with the exterior, a well-organized and sufficiently large police corps should patrol the borders of the stations and the buildings day and night.

"(*q*) Any group among whom there has developed no new cases of cholera or of choleraic diarrhœa during the preceding eight or ten days may be regarded as harmless, and allowed to leave quarantine after each one is finally immersed in a disinfecting bath and reclothed with clean garments from the skin outward ; the garments removed being destroyed or thoroughly disinfected and cleansed as above indicated.

"As yet, no reference has been made to the crew, ship, and cargo. What has been said of the treatment of those under observation applies to every one of the ship's inhabitants. The observation, isolation, and cleansing of the crew and their effects could safely be performed aboard ship, if necessary. The ship should be thoroughly cleansed and disinfected, particular attention being given to the quarters of the immigrants and crew."

In regard to the second, it must be observed that it refers to the three most important ports of entry of the Middle States, if not of the country, and to those which are in most immediate and constant communication with the whole grand interior chain of lines of travel and traffic. And while I cannot accept the conclusion that "there is no reason to believe that the conditions of other ports of entry upon our Atlantic and Gulf coasts are in any respect superior," yet it must be admitted that the possible exceptions to this sweeping condemnation are extremely few. Passing over the minutiæ of the report of these inspections, which should be carefully read by every practical sanitarian, I make a few extracts from the general conclusions arrived at :

"It is evident that the quarantine establishments at Philadelphia and at Baltimore fail, in the most essential requisites,

of the necessary number of properly equipped buildings for the isolation and observation of a large number of immigrants."

This is all the committee say with regard to these ports. Could condemnation be more utter and complete? Its very brevity is appalling. Its language is very nearly that of a letter addressed by the speaker to the Board of Health of Philadelphia a short time previously, which says: "Permit me, however, at the risk of seeming pertinacity, again to call your attention to the *entire inadequacy of the provisions made by the State authorities* for coping with a similar emergency in our own port." They "are those of nearly a century ago, when the present metropolis of Pennsylvania was but a country town. What might have been the consequence to her teeming population had the ship Alesia ascended the Delaware River to Chester, instead of anchoring off Sandy Hook, it is not pleasant to contemplate." New York, however, had a plant of sufficient dimensions to make it and its administration worthy of notice in detail. But so insufficient were the precautions and so defective the provisions there found, that the committee felt compelled to record their verdict that,

"It would seem that if the importation of immigrants directly from a European port notoriously infected is not to be temporarily prohibited, as a necessity of public safety, or if the treatment of these immigrants, after their arrival at the New York Quarantine Station, is not to be immediately and radically improved, our protection against an epidemic at the present time must rest mainly upon the fortunate circumstance of the near approach of a season in which the disease does not usually spread. The continuance of cholera among the passengers of the Alesia so long after their removal to the station of observation in itself demonstrates the inefficiency of the measures which have been adopted and enforced for its extinguishment there. Although we have not yet heard of the development of the disease anywhere on the mainland, nevertheless, in view of the almost uncontrollable tendency of cholera to spread at times, and of the original insufficiency and the present faulty constitution of the police force on Hoffman Island, we feel impelled to believe that the immunity up to the present time has been owing to singular good fortune, rather than good management."

The report concludes nearly as follows: "It is natural, after having made our comments on the defects of the quarantine stations we have described, that we should endeavor to point out their causes and probable remedy. There is one cause so prominent, that we may dwell on that alone. It is the great expense. Were it not for the question of money, there would have been physicians constantly in attendance at the New York station, and, consequently, better management and discipline would have been maintained, while at Philadelphia and Baltimore there would have been adequate establishments provided for the isolation and observation of large bodies of immigrants.

"Municipalities and States are wont to scrutinize every dollar of their money appropriations, bringing their expenses down to the closest living limit. Quarantine in this country being, as a rule, enforced mainly against yellow-fever and small-pox, a mistaken economy has caused no provision to be made for the more perfect establishments absolutely required for protection against cholera.

"Philadelphia, Baltimore, and other ports of a more limited commerce are unable to spend as much on their stations as is New York, with its large revenues from that source, yet an inefficient quarantine at any station exposes the whole country to the dangers of the importation of disease. But it is manifestly unfair that a single municipality or State should defray the expense of protecting the whole public.

"How, then, can we have equally complete stations all along the coast? We believe that this can be effected by putting quarantine into the hands of the national Government."

Continuing its valuable labors, the committee proceeded to draw up "An address to the medical societies of the United States concerning the dangers to which the country is exposed by the ineffectual methods of quarantine at its ports, and in regard to the necessity of national control of maritime quarantine." This address is based upon the combined results of Dr. Rauch's investigations and its own, and it aptly calls attention to the fact that an "inspection made during seasons of comparative quarantine inactivity" must of necessity be inadequate and misleading, and calculated to foster a false sense of security. Under the pressure of the emergency of a present

contagion and thousands of suspects, glaring deficiencies instantly manifest themselves which were before unthought of. The general propositions submitted in the address, as a result of the consideration of existing conditions, are as follows :

First. "It is impossible adequately to protect the public health of the country against the importation of epidemic diseases by independent local maritime quarantine establishments."

Second. "A national system of quarantine is necessary."

Third. "A national organization would secure advantages not attainable by independent local quarantine establishments, however complete."

Among the subsidiary statements with which they re-enforce these theses I note the following :

"There is always great difficulty in obtaining sufficient appropriations of public money to defray the expenses of the necessary quarantine establishments and their proper maintenance. It is only possible during periods of threatened invasion to procure the considerable sums of money necessary for these purposes, while in the interim the money expended is greatly inadequate, though large sums are constantly needed. When the invader is at our gates it is often impossible to plan, construct, or repair and properly equip and garrison an efficient line of defences.

"Rival political and commercial interests are inimical to the perfect protection of the general public by independent and local quarantine.

"It is but natural that municipal organizations should, in looking after their own interests, pay little regard to the welfare of distant communities.

"In this connection may be noted the indisposition and failure on the part of local quarantine officers to notify the authorities interested of the arrival of immigrants from infected localities. Notwithstanding the frequent paramount interest of inland communities in the efficiency of the establishment and administration of quarantine at the seaboard, the local authorities of the latter frequently evince an unreasonable jealousy of any sort of investigation or suggestion looking to the general welfare.

"The benefits of quarantine inure to the welfare of the

whole country; therefore, it is just that money should be as freely expended when necessary at one port as at another, without respect to their relative commercial importance. It is manifestly unfair that the seaboard cities and States should, as at present, be obliged to bear the entire expense of quarantine establishments designed to protect the inhabitants of every region of the vast territory of the United States.

"A national quarantine, properly administered and conducted by trained officials accustomed to deal with contagious and infectious diseases, would tend to prevent panic, to allay undue anxiety, and to favor a reasonable sense of security.

"Experience has shown that much needless alarm, as well as preventable danger, arises upon the appearance of an unfamiliar epidemic disease at quarantine stations; as when cholera has shown itself at New Orleans or New York, or yellow-fever at Philadelphia or Boston. A national quarantine would go far to do away with the necessity for vexatious temporary interstate quarantines, which so seriously disturb inland trade.

"A national quarantine system, directed in such a manner as fully to meet the requirements of existing sanitary knowledge, would not adversely disturb any commercial interest. It would, on the contrary, do away with many of the embarrassments incident to maladministration of existing local regulations. For example, the healthy passengers of the Italian steamship Alesia were detained at quarantine in New York Harbor for a period of fifty-eight days, while under an efficient system, uninfluenced by needless fears, those of them who were free from disease could have been safely liberated in ten days at farthest."

The committee thus sums up its conclusions:

"SUMMARY.—Under the present system of local and independent maritime quarantine, the necessary quarters for the detention of large numbers of immigrants arriving in a suspected vessel are either entirely wanting or, if at hand, are deficient in equipment or administration or both. It is possible, however, that one port, well governed and rich from prosperous commerce, may make up these deficiencies; yet what would this avail, even to that community itself, if a neighboring port, only a few hours distant by rail, failed to exclude

epidemic diseases. The front door might be doubly barred and bolted, but the enemy would find an easy passage through the defenceless rear. As recent examples thereof may be instanced the danger of an epidemic of yellow-fever to which the little town of Biloxi, in Mississippi, exposed in 1886 not only the interior States but even the city of New Orleans itself, now apparently so well protected by her own system of maritime quarantine; and that to which, in 1887, the defenceless condition of the small port of Tampa, in Florida, exposed not only that State, but others.

"This want of uniformity in the quarantine defences along our coast must necessarily exist when different authorities supply the money for maintaining the several stations and the purse of one port is longer than that of its neighbor. Another money difficulty is found when the appropriation for the same station comes, as it may, from the coffers of both city and State; possible difference of opinion in the municipal council and the State legislation is likely to endanger the sufficiency or change the direction of the funds to be expended. In any case, the danger to a single port of entry, or even to a single State, is by no means the same as that which threatens the country at large, and communities are not likely to make a larger expenditure than is needed for their own defence. As an illustration of a difference in the conditions of danger which may exist between the port of entry and the interior of the country may be mentioned the passage of immigrants with infected baggage. The immigrants may come from a healthy port and in a healthy ship, and with the poison securely imprisoned in their baggage, will pass through the port of entry with perfect safety to its inhabitants; the danger will begin in that far interior where the baggage is opened. It is of no interest to that port to have the baggage disinfected, and it is carried on to some uncertain place unhindered to do its fatal work. And here may be pointed out the rather peculiar position in which America finds itself, in attracting to its shores hordes of immigrants from the older countries. There is in municipalities little disposition to spend more even than is called for to satisfy immediate wants; remote necessities are seldom provided for. A quarantine that is not always in use is not always ready for use. It is only when danger is at its

gates and when, perhaps, it is too late for protection that a city wakes up to its defenceless state. Municipalities are selfish, and knowing that with the trader quarantine is not a favorable institution, and that it is his tendency to sail into that port where the quarantine is most lax, they are assailed with a sore temptation to wink at the neglect of proper precautions, if, by so doing, they may circumvent a possible commercial rival.

"In the opinion of the committee, the difficulties mentioned can only be overcome by the adoption of a maritime quarantine under the control of the national Government."

Commenting upon this report in its issue of November 5th, 1887, the *Medical News* of Philadelphia pertinently says:

"As the testimony of thoroughly competent and independent observers, a committee of one of the most conservative and respected medical bodies in America, it carries with it the weight of conviction and conclusively proves the urgent necessity of a radical reform in our method of guarding the country against devastating epidemics, with which we are, through foreign communications, from time to time threatened.

"Should the germs of cholera finally escape or be permitted to pass beyond quarantine, they may not limit their onslaught to the nearest city, but may spread over the land and ultimately carry sorrow and loss to homes hundreds and even thousands of miles distant from the port where they entered.

"The abuses and the faults of an exclusively local quarantine, such as at present exists, are so natural and intrinsic that we should by this time acknowledge the absolute need of a national protection of the general welfare by a national maintenance and administration of quarantine."

Meantime, the entire country appears to be waking up to a sense of the urgent need for immediate and definite action in the direction indicated. The Senate Committee "on Epidemic Diseases, in relation to Seaboard Quarantines" has had under consideration during the present session the following bills, resolutions, and memorials:

Senate Bill 665, "To establish a quarantine station at the port of San Francisco;"

Senate Bill 1641, "To establish a permanent quarantine station at or near Cape Charles, Va.;"

Resolutions of the Legislature of the State of Virginia, in the nature of a memorial, asking the establishment of a quarantine station at Cape Charles;

Resolutions of the Board of Trade of Chester, Pa.;

Petition of the Board of Health of Rockford, Ill.;

Resolutions of the Board of Health of Charleston, S. C.;

Petition of the Medical Society of San Diego, Cal.; and

Resolutions of the American Public Health Association;

All urging the establishment of national quarantine at the points of danger upon the Gulf and sea-coast.

The committee expresses its belief "that it is the duty of Congress to so regulate commerce as to prevent the introduction of contagion from foreign countries into the United States, and has therefore reported, with favorable recommendation, an original bill providing for the establishment of seven thoroughly equipped quarantine stations in addition to the one already provided for at the mouth of the Mississippi River—viz.: at the Delaware Breakwater; Cape Charles, Va.; Sapelo Sound, Key West, Fla.; San Diego, Cal., and Port Townsend, Ore.

"The estimated aggregate cost of construction and equipment of these quarantine stations, including the one at the mouth of the Mississippi River, is $489,500, and the estimated aggregate annual cost of maintaining them is $93,000."

It is not conceivable that when once the national Government has committed itself so far both in policy and expenditure, it will long delay the extension of this system northward and making it uniform throughout the entire coast line. Of course, there will be difference of opinion as to whether the bureau into whose hands would fall the superintendence of these stations under the existing law is the appropriate one; whether the preservation of the public health is not an interest of sufficient magnitude to entitle it to a department of its own. But when such substantial safeguards are offered us it would not be the part of wisdom to reject them on merely theoretical or sentimental grounds. Consider for a moment the unprotected condition of the Delaware River as revealed in the reports just referred to; ascending the bay and river a distance of nearly eighty miles before the Pennsylvania or Philadelphia quarantine station is reached, through a populous country,

passing numerous villages and two considerable cities, with no other restrictions than the local regulations of the coasting trade; the Philadelphia quarantine station situated close to a large and rapidly growing city, whose Board of Trade have already taken the alarm and protested in a memorial to Congress against the dangerous contiguity; and yet both the State of Pennsylvania and the city of Philadelphia are utterly powerless to remove it to a better and more distant location, from the simple fact that the boundary of the State is only a few miles lower down the river, and the entire intervening distance along the river bank is one continuous settlement.

The only proper site for a quarantine station is within the limits of the little State of Delaware, and the expenditure necessary to establish and maintain a properly equipped station for the protection of Pennsylvania, New Jersey, and the "parts beyond" would drive her into immediate and hopeless insolvency. There are but two solutions of this pressing local problem: either the national Government must promptly establish a well-appointed quarantine down the bay, or the three States of Pennsylvania, New Jersey, and Delaware must form a tripartite alliance and unite in defraying the expense of protecting themselves and the nation against their common foe.

It is a question, however, whether this would not be establishing an *imperium in imperio*, which would be more defiant of the Constitutional restriction than the federal interference for which it would be a substitute.

In conclusion, I beg leave to offer the following resolution:

Resolved, That the section on State Medicine respectfully suggests to the American Medical Association the importance of formally urging upon the national Congress the duty of at once assuming entire control of the maritime quarantine; of taking immediate measures to make such quarantine effective before the advent of hot weather.

THE "BEST EDUCATION" does not mean a knowledge of a trade, a business, or a profession, but it does mean the possession of a mind so disciplined and trained as to be able to grasp the problems of life and solve them.—*The School Journal.*

PUBLIC FILTH IS PUBLIC DISGRACE.

WE clip the following admirable letter from the paper to which it was addressed. The force of its application is by no means limited to New Orleans. And it it is eminently worthy of republication in every newspaper in the United States.

NEW ORLEANS, May 21, 1888.

To the Editor of the Times-Democrat:

Nothing is as costly as disease, and nothing promotes disease as much as filth; there is, therefore, no duty which the public owes to itself more imperative than removal of the common filth, and since protracted heat greatly augments the destructive influence of filth, there is no time when its removal is so important as at the approach of summer.

The public, which imposes on its municipal officers the duty of removing the common filth and yet fails to provide them with adequate means, proves conclusively that it is unfit for self-government. Since April 17th I have entertained a respect for the voting majority of my fellow-citizens never before enjoyed, and have indulged the hope that the good intention, then manifested, would soon prove, by deeds, that this public was capable of wise self-government, appreciative of its sanitary and other needs, and competent to provide all means indispensable to the common welfare.

If the public treasury cannot provide the means, then the sole resource is voluntary contributions, which, either of money or labor, every citizen can give. Is it possible that this city, with 40,000 voters, is to continue with streets and gutters reeking with accumulating and disgusting filth, and nauseating us with sickening stenches, when our own officers, chosen because of our confidence in their integrity and capacity, assure us that our Augean stable can be cleaned and kept clean if we will aid the public treasury to the extent only of some $10,000 to $40,000?

Even the larger sum is only a dollar for every voter, but this dollar cannot be collected. Are we then willing to admit that New Orleans has not even 4000 citizens who will give us $10

each, or 1000 who will give $40 each, or 400 who will give $100 each? Surely 100 citizens, selected from our various associations and Exchanges, could readily secure subscriptions for even $400 each, or for whatever less amount may be requisite to contribute to the health of some 250,000 of our fellow-citizens. The cost of cleanliness is great and is vividly realized by every one who taxes his own purse; but the cost to the whole community of disease due to filth is far, far greater, although unfortunately not realized, except perhaps by the few who happen to be sick.

Leaving soon for the summer, the filthy condition of New Orleans will affect me personally much less than most of my fellow-citizens, yet I would cheerfully contribute my full share of money or labor, even go in person with spade, bucket, and broom into the street, rather than submit silently and inertly to the evils this city now endures and has long endured with a listless stupidity which deserves condemnation as a public crime, when we consider that our helpless young children are the chief victims.

Those worthy citizens, Clark & Meader, have given an example of public spirit which many, no doubt, will follow. And if all the worth of New Orleans could be persuaded to realize the value of health and to unite upon the most obvious means to secure it, the good results would soon be apparent and most gratifying. No investment of money ever yields such enormous returns of happiness as money wisely spent for health.

STANFORD E. CHAILLE.

THE MOST IMPORTANT ANTISEPSIS.

By L. BARKAN, M.D., Brooklyn.

THE healthy human organism may within certain limits be considered an apparatus for self-disinfection. Innumerable quantities of germs surround, pervade, and pass through it without leaving any appreciable trace of their contact. Fortunately, not all of these germs are virulent, many of them are innocuous, and even the dangerous ones vary in degree of harmfulness.

In the light of recent bacteriological researches, we are justi-

fied in assuming that most of the constitutional diseases are due to infection by some characteristic bacillus, but it would be erroneous to infer that every one of these bacilli, by its invasion of the human system, in each individual case produced the characteristic systemic disturbance of which it is known to be the cause. Could all these invisible hordes of tormentors and slayers enter the system at the point of attack, then our populous cities would be but vast hospitals, and no single individual would reach the number of years which now constitute the prime of life.

A healthy and well-nourished body is endowed with great powers of resistance to the action of most, if not of all, species of bacilli, thus rendering itself aseptic by virtue of its own healthfulness. A few references to actual experiments will suffice to show the correctness of this view. Professor Traube experimented in 1876 by injecting a quantity of pus into healthy dogs. After twenty-four hours he found no trace of it in the system ; his results, however, were different when the quantity was increased. Dr. Trudow inoculated fifteen rabbits with tubercle bacilli ; ten of them, which were kept in damp, impure air and on improper food, developed tuberculosis. The five others were permitted to run about in good, pure air, and were well nourished ; of these, only one died of a resultant tubercular affection, and four remained well. The experiments of Brown-Séquard, which were made before those of Dr. Trudow, yielded still better results, since of all the animals inoculated with the tubercular virus, not one was lost. He ascribed these results to their being kept in a well-aired open place, supplied with abundant nutriment.

In patients who had only recently developed symptoms of phthisis, Brown-Séquard, Stokes, and Blake aborted the disease by the same treatment of saturating the system with pure air and good food. It must be apparent, therefore, that the power of self-disinfection depends chiefly upon two factors : 1. Thorough impregnation with oxygen of the air. 2. Generous alimentation. These agents must be relied upon to give to the blood that richness, vitality, and vigor which enable it to ward off an invasion of bacterial foes, and by the aid of which they can be most speedily repulsed and driven from the system, even though they have entered the circulation at a vulnerable spot. In addition to these two important factors, several

other hygienic requisites must not be overlooked, such as congenial temperature, sunshine, clean dry soil, pure water, moderate exercise, etc., all of which are valuable as accessories to produce the full beneficial effect of pure air and abundant food.

The power of self-disinfection is greatly impaired whenever a serious illness, aggravated by febrile symptoms, takes possession of the body, but it is gradually restored when the illness subsides. Of all the duties of the physician, none is more important than to aid the prostrate organism in its struggle to recover the lost power of self-disinfection, not only by antiseptic chemicals, which are of excellent service wherever their application is admissible, but also by surcharging the system with pure air and nourishing food.

Trite as it may seem, I cannot abstain from dwelling upon the necessity for thorough instruction of the attendants in the detail of this work, particularly if the nurses lack professional training. If the physician will explain that all discharges must be quickly removed and all vessels disinfected; define the details by which, according to the location of the sick-room, the most effective ventilation can be accomplished without exposure of the patient; take the trouble to lay down strict rules of what and how much the patient must eat and drink during stated intervals; and insist upon having a full record kept of the food ingested, he will find himself amply repaid, both by the better condition of his patient and the clearness with which he can trace the effect of his treatment. I do not mean that the rules as to particular articles of diet must be inflexible; on the contrary, considerable latitude must be allowed in this respect according to the circumstances, the age, and peculiarities of the patient. But it is necessary that such food be selected as is most nourishing and digestible, and that a fixed minimum quantity be prescribed for ingestion during every twenty-four hours, at least during the critical periods of the disease. Up to within a few years ago the physician was almost powerless to nourish his patient during those periods when the stomach, weakened from fever and suffering, rebelled against its work. Indeed, it is pitiable to think how many lives have been lost from sheer lack of some food which the enfeebled digestive apparatus could prepare for assimilation, so as to tide over the dark hours of the struggle and put the exhausted organism once more on the road to health—to a

gradual and complete self-disinfection. But of late years a most important weapon in defence of human life has been placed in our hands with the invention of peptonized foods, particularly that class of preparations known as "beef peptones." Unlike the ordinary meat extracts, they contain not only the stimulating portions, but also the nourishing, life-sustaining albuminoids of the beef in the predigested form known as "peptones," in which they are nearly ready for immediate absorption and assimilation. Thus they combine the two cardinal requisites for reconstruction of tissue: highest nutritive value and greatest digestibility.

Unfortunately, the great body of the profession fail to recognize the importance of peptones for the prevention of the marked loss of tissue in prolonged febrile movements and in other conditions in which digestion is impaired. Having used beef peptones (generally Rudisch's "sarco-peptones") in a great number of cases during the last four years, particularly in typhoid-fever, dysentery, cancer of the stomach and rectum, phthisis, scarlet-fever, diphtheria, anæmia, vomiting of pregnancy, gastric troubles of all kinds, nervous dyspepsia, Bright's disease, ulcers of the stomach, peritonitis, and cholera infantum, I have come to the conclusion that beef peptones are more nutritive than milk, that the stomach retains them when it tolerates no other food, that infants and aged people can be nourished by them when milk is rejected, and that there is no therapeutic or dietetic agent which in disease will repair bodily waste as quickly, as effectually, and with as little assistance by the digestive organs as beef peptones. I am confident that in many of my own cases, both of children and of adults, a fatal termination has been averted by the timely use of beef peptones.

Appreciating the fact that good air and good nourishment must be chiefly depended upon to check the destructive work of bacilli in the living organism, and possessing in beef peptones a valuable agent to support vitality in the decisive hours of this mighty contest, I now assume charge of the most serious cases with a feeling of greater power and usefulness than heretofore. The records of my case-book will bear out my belief that by a more general adoption of these views and of the dietetic agent mentioned, many valuable lives could be saved or prolonged.—*New York Medical Journal.*

THE AMERICAN MEDICAL ASSOCIATION.

THE thirty-ninth annual meeting, recently held in Cincinnati, was one of the most pleasant and profitable that has been held during the last decade. The arrangements made both for scientific work and social reunions by the profession of Cincinnati were all that could be desired. The general morning sessions were well attended, and the addresses of the president and Drs. Bartholow, Moore, and Walcott, on the progress made in the several departments of medicine, were listened to with unusual interest and profit. All of the sections were fully occupied, and some of them held two sessions a day, on account of the number and value of the papers read and discussed. Our abstract is limited to

THE PROCEEDINGS OF THE SECTION ON STATE MEDICINE.

The section convened on Tuesday, May 8th, 1888, and was called to order by the Chairman, Dr. H. B. Baker, of Michigan, who proceeded to deliver his address, as required, on the "Progress of State Medicine." After referring to the short time to which he was limited for a comprehensive survey of the field of sanitary literature, he referred to the increased number of local and State boards of health and the evidence of popular interest in the subject, evinced by the number of sanitary journals. With Dr. Rohé, he considered the watchwords of sanitary progress—*Notification*, *Isolation*, and *Disinfection*. He dwelt upon the necessity for protecting municipal water supplies, and commended the example of Massachusetts in appropriating $30,000 to preserve the purity of the inland waters. The increase in the number of bacteriological laboratories in medical colleges showed the progress of professional interest in preventive medicine. He reviewed the literature of bacteriology and referred to the discovery of the specific causes of typhoid-fever and summer diarrhœa. He briefly reviewed the national legislation on quarantine and thought the general Government should not interfere with local quar-

antines unless so desired. But diphtheria, scarlet-fever, and typhoid-fever he thought should be made the subjects of quarantine as much as yellow-fever or cholera. As all the cholera in the world comes from an area about Calcutta, he would suggest that all nations unite in international co-operation in cleansing that locality.

Dr. J. Berrien Lindsley, of Tennessee, read a paper on the cremation of garbage, reviewing the statistics of garbage collection in some of the larger cities and garbage destruction in those localities in which crematories were in use. His paper elicited discussion by Drs. Morris, of Maryland, Jones, of Ohio, Schenck, of Kansas, Lee, of Pennsylvania, Hamilton, United States Marine Hospital Service, and Walcott, of Massachusetts.

Dr. Lee, of Pennsylvania, read a paper: "Should not the National Government Defend our Ports against the National Enemy, Contagious Disease?" He reviewed the Constitution relating to this subject, and considered that Congress, in making appropriations expendable at the discretion of the president, showed that it possessed the necessary authority. He quoted extensively from the Report of the Committee of the College of Physicians, of Philadelphia, on the quarantines of Boston, New York, Philadelphia, and Baltimore, but thought that the burden of protecting the health of the country at large should not rest upon so few ports of entry. In conclusion, he submitted a resolution urging Congress to assume charge of all quarantines.

In the discussion which followed this paper, on the motion of Dr. Lindsley, of Tennessee, a committee was appointed, with Dr. Lee as chairman, to draft a resolution petitioning the House of Representatives to take immediate action on the bill providing for the establishment and equipment of quarantine stations at Delaware Breakwater, Norfolk, Sapelo Sound, Key West, San Diego, San Francisco, and Port Townsend.

Second day, May 9th: The first business of the section was the election of officers for the ensuing year, which resulted in the choice of Dr. J. Berrien Lindsley, of Nashville, Chairman, and Dr. S. T. Armstrong, United States Marine Hospital Service, New York, Secretary.

In the absence of the Chairman of the Committee to Report on Uniform Medical Practice, and a conflict of opinion among the members of that committee, on the motion of Dr. Rauch, the committee was continued, to report at the next meeting of the association.

Dr. H. B. Baker read a paper: "Malaria and the Causation of Periodic Fever." His conclusions were: "1. Intermittent-fever is proportional, directly or inversely, to the average daily range of atmospheric temperature. 2. The controlling cause of intermittent-fever is exposure to insidious changes in the atmospheric temperature. 3. In the mechanism of the causation of intermittent-fever the chief factor is the delay in the reaction to exposure to cool air; this delay, extending to a time when greater heat loss should occur, results in the abnormal accumulation of heat in the interior of the body and in disturbed nervous action—the chill; and the final reaction is excessive, because of the accumulation of heat and sometimes because it occurs at the warmest part of the day. 4. The fever is the excessive reaction from the insidious influence of the exposure to cool air; and it is periodical because of the periodicity of nervous action, and because the exposure and the consequent chill are periodical, owing to the absence of the warmth from the sun at night. 5. Residence in valleys or on lowlands through which or upon which cold air flows at night, and thus causes insidious changes in the atmospheric temperature, favors intermittent-fever. 6. In our climate those measures, such as drainage, which enable the soil to retain warmth during the night and thus reduce the daily range of temperature immediately over such soil, tend to decrease intermittent-fever among residents thereon. 7. In the cure and prophylaxis of intermittent-fever, those remedies are useful which lessen torpidity (especially of the liver) and tend to increase the power of the body to react promptly to insidious changes in atmospheric temperature."

Dr. A. N. Bell, not being able to be present, sent a paper entitled: "Malaria and the Causation of Fever in the State of New York." His conclusions were: "1. Malaria is coincident with accumulations of organic matter in process of putrefaction in alluvial bottoms, on the margins of sluggish streams, low humid borders of stagnant ponds and lakes, the marshy

borders of the seashore, and *circumscribed local conditions*, chiefly artificial, comprehending more or less the same relations to vegetable débris and other organic matter in process of decay as the outlying conditions mentioned in this connection. 2. While it is not possible in the present state of our knowledge to determine the special relations existing between malarial diseases and the geological, thermal, hygrometrical, and barometrical conditions under which they occur, those thermal and hygrometrical conditions most promotive of putrefaction coincident with the absence of sunlight are in the highest degree promotive of malarial poison."

A letter from Professor Tommasi-Crudeli on the Bacillus Malariæ was read: he considered that it was impossible for a man to have ague without the presence of the malarial ferment in his body. Considered that temperature variation favored the introduction of this ferment.

Dr. Ferdinand Cohn sent a paper by Dr. Bernardo Schiavuzzi, of Pola, as expressing his views. This experimenter believed in the bacillus malariæ of Klebs and Tommasi-Crudeli, and narrated experiments on rabbits.

Professor Laveran sent his paper on the hematozoon malariæ, in which he reviewed the literature of the subject and the constant presence of the hematozoon in all cases of malariæ.

A vote of thanks was tendered each of these foreign investigators.

Thursday, May 10th: The committee appointed to draft a resolution reported:

Resolved, That this association urges upon the House of Representatives of the Congress of the United States the necessity and importance of the immediate passage of Senate bill number 2493, *To perfect the quarantine service of the United States*, which bill has passed the Senate and is now pending in the House of Representatives, in order to make provision for protection against the introduction of contagious disease before the approaching summer. Signed, Benjamin Lee, J. Berrien Lindsley, James J. Reeve. The resolution was unanimously adopted by the section, and was transmitted by the secretary to the association.

Dr. Victor C. Vaughan, of Michigan, read a paper on the "Causation of Autogenous Fevers," discussing the subject

from a bacteriological standpoint, with special consideration of the influence of Lucomaines.

Dr. J. A. Larrabee, of Kentucky, read a paper, "The School-room a Factor in the Production of Disease," in which he made a comprehensive survey of the unsanitary features of modern school-houses and their occupants.

Dr. T. B. Greenley, of Kentucky, read a paper, "Hygiene of Infancy and Childhood," making a very comprehensive survey of this extensive field.

No further business being before the section, with a vote of thanks to Dr. Baker for the energy he had exerted in furthering its interests, it adjourned.

EDITORIAL NOTES AND COMMENTS.

ATTENTION is particularly invited to our CHANGE OF ADDRESS. *All* correspondence and exchanges and all publications should be addressed :

113A Second Place, Brooklyn, N. Y.

SULPHATE OF QUININE AND THE TARIFF.

IN July, 1879, sulphate of quinine, which had been for many years required to pay a duty of 20 per per cent ad valorem, for the benefit of a coterie of American manufacturers who kept the price so high as to deprive thousands of sick poor people of its use, was put upon the free list. It is interesting at this particular period to review the effect of this change and to contemplate the benefit.

For the last five years, 1874–78, under the ad valorem duty of 20 per cent, the importations of sulphate of quinine amounted to 196,475 ounces—an average of 39,295 ounces yearly, and the average price was $2.83 per ounce.

In 1879, the year in which the duty was abolished, the importation amounted to 228,348 ounces; and for the remainder of the year (from July) the manufacturers managed to keep the price up to $3.10 per ounce, and made much ado about the failure of legislation to reduce the price. But their kicking against the pricks speedily weakened.

For the five years next after sulphate of quinine was put upon the free list, 1880–84, the importations were respectively, 416,778, 408,851, 794,495, 1,055,764, 1,263,732: 3,939,850 ounces, and the average price per ounce $2.10. For the three years 1885–87 the importations have been respectively, 1,390,126, 1,251,556, 2,180,157: 4,821,839 ounces, and the average price 73¼ cents per ounce.

And yet these same would-be monopolists of 1878, who would, for their own interest, increase the fever rate and the burdens of the sick, are now engaged in an effort to make it appear that the repeal of the duty of 20 per cent which obtained previous to July, 1879, has had nothing to do with the decrease of the price, but that the effect is wholly due to (the collateral benefit of abolishing the duty) the increased culture of cinchona trees.

THE NEWTOWN CREEK NUISANCE.—Apropos of the again recurring annual proclamation of intent by the New York State Board of Health to abolish the stench arising from Newtown Creek and its vicinity, is the recent finding of Dr. Vanderberg, the City Chemist and Gas Inspector of Buffalo. In accordance with instructions from the Board of Health of that city, to ferret out the party or parties responsible for the dissemination of an odor which made the lives of persons residing in the neighborhood of the old Buffalo and Citizens' Gas Light Company's works a burden to them, he found the real culprit to be a wholly different concern—the Barer Asphalt Pavement Company. Whether this discovery will turn out to be like the annual discoveries about Newtown Creek is yet to be seen; it greatly depends upon the political strength of the company.

Newtown Creek is the division line between Brooklyn and Long Island City, and has been more or less an open sewer into which other sewers of both cities have discharged their contents for many years, besides being the receptacle of the drainage of numerous cow stables, slaughter houses, rendering establishments, sugar refineries, fertilizer and other manufactories. Moreover, the Long Island City side of the creek has long been used as a manure depot for the stable keepers and manure dealers of New York, covering an area of several

acres, saturating the marshy soil with its seepage and adding to the foul stream. Meanwhile, in the summer-time especially, a lively commerce is kept up by the continuous passing of tow-boats and other craft. The putrefying mud at the bottom is thus constantly being stirred up and the waters bubble with the stinking gases evolved, which are wafted over to Murray Hill and to places round about more or less distant.

Under the declared determination of the State Board of Health, soon after its organization, to abate this nuisance, more than six years ago, we had occasion to remark that if all the factors at that time contributing to it were summarily removed the stench would still continue for at least a dozen years, so foul was the soil for many acres in extent on both sides of the creek.

On the evidence adduced at that time, in 1883, the State Board procured an indictment of some eight or ten contributors to the nuisance, and a few of the weaker ones were suppressed; but those who are most familiar with the conditions well know that the root of the matter has not been reached, and that the mere singling out of sludge acid at one time, the cream of tartar works at another, or the Standard Oil Company's works at the present time, only serves to divert attention from the main issue. The bed of the creek and the marshy soil bordering thereon of about one hundred rods in width and two miles in length on either side, and a morass of about a mile by a half mile in area, which gives rise to the headwaters of the stream, constitute, approximately, the extent of one of the most disgraceful nuisances in existence—to which the public works of Brooklyn and Long Island City by the discharge of sewage, and New York dealers in manure by storage, have been and still continue to be the chief contributors. And so long as this is the case, it is of but little moment for the State Board of Health or the city health authorities to urge the responsibility of offensive trades.

Even to the superficial observer—aside from the danger to health by the maintenance of this nuisance and the certainty of its localizing influence in the promotion of epidemic diseases and their pecuniary cost to the community—the question arises: To what extent would the commerce of Brooklyn and Long Island City be benefited by the use of other means for

the disposal of sewage, draining the adjacent marshes, dredging Newtown Creek, and facing its banks with stone, and prohibiting foul deposits on its banks? It would doubtless cost a good deal of money, but its commercial advantages would be enormous. Besides, with any just estimate of the value of human health and life, viewed in its sanitary aspect, the profits arising from the promotion of the public health and the saving of human life by such improvement would alone pay for them in twenty years.

" SEWER-GAS AND DISEASE.—Because *all* sewer-gas—that is, because the gas from all sewers and waste pipes which carry sewage is not poisonous, Dr. James N. Campbell, of St. Louis, has undertaken to show by a contribution to *Building Trades Journal* that there is little or no danger from sewer-gas under any circumstances. He ventures to illustrate his proposition, however, by comparing it with the stagnant air of unventilated sleeping apartments and workshops, but fails to follow his illustration to the practical issue. He should have followed his simile by showing that the air of unventilated sleeping apartments befouled by the putrefaction of organic matter exhaled by the lungs and skin is comparable with that of sewage in process of putrefaction, in consequence of retained sewage by unventilated sewerage works or bad plumbing. He would not then be likely to call in question such testimony as the following—to which much more might be added—instead of catering to the popularization of a dangerous doctrine through the trade papers.

At a recent meeting of the Medical Society of the County of Kings, Dr. J. H. Raymond, late Health Commissioner of Brooklyn, stated that, during the prevalence of typhoid-fever in that city in 1885 :

" In almost every instance where a case of typhoid-fever was found in a house, I think without exception, there was a condition of plumbing which would account for the entrance of sewer-gas, so that if the air of that particular sewer was infected with typhoid-fever, we could understand how it might find its way into the house, the sewer air serving as a carrier of the germ."

Dr. Bartley said : " I have seen cases of typhoid-fever where

the attending physician made no attempt whatever to disinfect the discharges; and it seems to me, in the light of evidence that Dr. Raymond has brought forward, it is almost criminal to pour those discharges into the sewer and thus infect it. I had last fall a case from such a source, where the physician who treated the case diagnosed it as what is ordinarily called typho-malarial-fever. There were three cases developed in one house below that on the side of a hill, where the plumbing was known to be very bad and afterward taken out and replaced. In one or two houses between where these occurred and where the first occurred, where the plumbing had recently been entirely renovated, no cases occurred, but cases did occur about the same time in the house below. I think that the matter of disinfecting the discharges is so important that it ought to be brought to the attention of physicians, because I do not think they really appreciate it."

Dr. Hunt, Health Officer of Utica, N. Y., says that unquestionably the cause of nine tenths of the cases of diphtheria reported in that city last season was sewer-gas. He founds his opinion upon the fact that in most of the houses inspected where diphtheria existed, the house drainage was so defective as to readily permit the return of gas from the main street sewer into the kitchen.

"BACILLI IN SALT WATER" is the title of an extremely dubious report of Assistant Surgeon J. J. Kinyoun, U. S. M. H. S., which is going the rounds of the medical press, that purports to show the infection of the water of the Lower Bay of New York with cholera germs from Hoffman Island, or by the choleraic discharges of patients detained there or on board the cholera ships anchored in the Lower Bay last summer.

That salt-water bacilli may be found in the waters anywhere in the harbor of New York at any time is highly probable, when we take into consideration the thousands of tons of sewage discharged therein daily; but that *cholera* bacilli have been discovered among the host of scavengers of the bacilli kind always to be found under such circumstances is too far-fetched for reasonable belief.

DISINFECTION IN QUARANTINE.—We are gratified to learn by the New Orleans *Times-Democrat* that it is the purpose of

the United States Marine Hospital Service to adopt the system of disinfection so successfully practised under the direction of Dr. Holt at the Mississippi quarantine, at the Gulf Station, Chandeleur Island.

THE YELLOW-FEVER GERM!—Dr. George M. Sternberg, United States Army, who was authorized last year by special Act of Congress, and commissioned by the President of the United States, to proceed to Brazil and Mexico and investigate the reported discovery of the yellow-fever germ and the methods of inoculation for protection against yellow-fever by Drs. Domingos Friere, of Rio de Janeiro, and Carmona y Valle, of Mexico, and report upon the same, declares that both are mistaken; that no specific germ of yellow-fever has yet been discovered, and that inoculation as practised at Rio and Vera Cruz is without scientific value.

It is remarkable, however, that Dr. Sternberg's visit to and investigations in Rio were made in June and July, when the fever does not prevail, and, unfortunately, in the absence of Dr. Friere. Possibly, all the evidence was, under these circumstances, not available. Moreover, Dr. Sternberg reports the absence of yellow-fever on the coast of Mexico at the time of his visit there.

The investigation is not at an end, however. Dr. Sternberg is under orders to proceed to Havana and continue his investigations in that place, where he will doubtless have abundant opportunity, and his well-recognized competency in this regard leaves no room to doubt that his final report will be exhaustive and conclusive under the present light of the science of biology.

THE YELLOW-FEVER IN FLORIDA (from Surgeon-General Hamilton's Abstract of Consular Reports):

"Dr. Jerome Cochran, of the State Board of Health of Alabama, in a recent report has stated that the late epidemic of yellow-fever in Florida was not introduced into the State by the usual trade channels, but by smugglers. This confirms unofficial statements received at this bureau some weeks since. Dr. Cochran states that the last case was discharged May 11th, and the last death occurred May 8th, and that there have been

active precautions taken to prevent the reappearance of the disease."

Dr. J. P. Wall, President of the Board of Health of Tampa, who has made no secret of his opinions adverse to the practice of quarantine, now that yellow-fever has been introduced into the State in default of it, writes to the surgeon-general under date of May 23d :" The Plant steamers from Havana landed at Port Tampa for the first time on the 13th instant. . . . The disinfection is done on board of steamer for the present, as in previous years. As you know, it is the company's policy to prevent the steamers from becoming infected, and although every pains will be taken here as to the disinfection of baggage, the rules and regulations of the company as to not allowing unacclimated persons to take passage will be still enforced as in the two previous years"—presumably, with the same results. Because no such practice, above all when its supervision depends upon one who believes quarantine to be useless, can be relied upon to prevent its introduction; and in view of such reliance by Dr. Wall, it is by no means surprising that at the recent States' Board of Health Conference, in Cincinnati, a resolution was adopted contemplating early quarantine against Florida.

ELECTRICITY TO SUPERSEDE HANGING IN NEW YORK.

Governor Hill has signed the bill abolishing hanging for all murders committed after January 1st, 1889, and substituting death by electricity therefor.

The bill consists of elaborate and carefully drawn amendments to the Code of Criminal Procedure, providing that the prisoner sentenced to death shall be immediately conveyed by the sheriff to one of the State prisons, and there kept in solitary confinement until the day of execution, to be visited only by officers or by his relatives, physician, clergyman, or counsel. The court imposing sentence shall name merely the week within which the execution is to take place, the particular day within such week being left to the discretion of the principal officer of the prison. The execution is required to be practically private, only officials, clergymen, physicians, and a limited number of citizens being allowed to be present. After the execution funeral services may be held within the prison

walls, and the body shall be delivered into the custody of relatives if requested, otherwise it shall be decently interred within the prison grounds.

THE McCLELLAN TRAP VENT.

PATERSON, N. J., June 12, 1888.

Dr. A. N. Bell, Editor of THE SANITARIAN :

AS your name appears as one of the references on a circular I have received setting forth the advantages of the "McClellan Trap Vent," I take the liberty of inviting your attention to and requesting your opinion of the criticism I here enclose, clipped from a recent number of the (Brooklyn) *Review and Record.*

"What is to guarantee that the mercury seal in the 'Anti-Siphon Inlet' will not, in the course of time, be broken by evaporation?" ALBERT GALLANT.

Its *stability*, in consequence of its low volatility. For although mercury volatilizes in some degree under the ordinary temperature of the air, when we take into consideration its specific gravity, 14.4, and its boiling point, 357°, it is evident that the slowness of this process under any temperature to which the seal is likely to be exposed is so extreme as to divest it of all reasonable probability of being broken on this account.

MORTALITY AND MORBILITY STATISTICS IN THE UNITED STATES AT THE MOST RECENT DATES.

☞ It would greatly add to the interest of the reports under this head if all correspondents would give the ratio of the *death-rates per* 1000 *of population per annum*, by which different populations could be compared.

CALIFORNIA.—The Secretary reports the number of deaths for April, 1888, from the returns of 85 localities in different parts of the State comprising a population of 709,550, 1005. Annual death-rate, 16.8.

Consumption is credited with 189, or 18.82 per cent of the total mortality.

Small-pox caused 7 deaths only, as against 15 in March—4 in San Francisco, 1 in Sheep Ranch, and 2 in Los Angeles.

"In Los Angeles they have a great many cases, but owing to the neglect of the Health Officer to furnish returns, although requested to do so, we are unable to state just how many cases occurred during the past month. We believe, however, that the Health Officer does not desire the number known, which is a mistake on his part."

In relation to the large mortality from consumption, the Secretary remarks:

"Our greatest mortality is derived from visitors from the East who with diseased lungs seek this coast in pursuit of health; without this constant addition to our death-rate our percentage of mortality would be wonderfully small." It would be interesting to show the actual results by statistics; and the more, for the reason that the mortality from consumption—as well as from other causes—appears to be largest in the smaller and thinly populated towns and vicinage. For example, for the 30 days of April:

Bakersfield (1500), 12 deaths—from consumption, 2; Alameda (2000), 9 deaths—from consumption, 2; Eureka (3000), 14 deaths—from consumption, 2; Lincoln (600), 3 deaths—from consumption, 2. More might be cited of the same purport; and the interest of the tabulated report of the nearly 100 different localities, monthly, would be greatly enhanced by the addition of another column giving the annual ratios per 1000 population of *every locality*.

The larger cities are evidently more salubrious than many of the smaller towns and some of the vaunted "health resorts," probably due, for the most part, to organized sanitary service. But some of the conditions of the much-praised interior climate suggest themselves as being probable factors upon which, and such data as those already referred to, with regard to visitors, etc., authentic statistical facts would be of much value.

San Francisco (300,000) reports for the month deaths 502—death-rate, 20.3; from consumption, 90—nearly 18 per cent of total mortality.

Los Angeles (70,000) 56—death-rate, 9.6; from consumption, 9—16 per cent.

Oakland (50,000) 62—death-rate, 15.08; from consumption, 12—19.5 per cent.

San Diego (32,000) 49—death-rate, 18.6; from consumption, 6—16.3 per cent.

Sacramento (30,000) 28—death-rate, 11.6; from consumption, 6—20 per cent.

CONNECTICUT.—*Tenth Annual Report of the State Board of Health* for the year ending November 1st, 1887, with the Registration Report for 1886, relating to Births, Marriages, Deaths and Divorces. Pp. 333 and 165. From the reports of 160 local boards of health, monthly, and several annually, brief abstracts are given showing the general state of the public health of Connecticut throughout the year. Next follow the reports of delegates to the Conferences of the State Boards of Health, and the American Public Health Association, indicating the general state of the public health and of the measures in active co-operation for its promotion throughout the country. Next follow some special reports on, and contributions to, the work of this particular board, but of general application. Remarkably so is the Report on the Pollution of Rivers, by Professor Samuel W. Williston, M.D., Ph.D., with Water Analyses, by Professor Henry E. Smith, M.D., and William G. Dagget, M.D., comprehending the pollutions by sewage and factory refuse of various kinds, self-purification, bacteriological and chemical analyses.

Epidemic Dysentery in Thomaston, by R. S. Goodwin, M.D.; Sanitary Report for the City of Waterbury, by C. W. S. Frost, M.D.; and Remarks on the Recent Outbreak of Typhoid-Fever at Southampton, L. I., by F. E. Beckwith, M.D., while dealing with particular places, also present lessons of practical importance to numerous places elsewhere, and hence add importance and value to the report.

Registration Report (for 1886) is based upon a population of 715,329, the aggregate of estimates obtained from the Town Clerks of all the towns in the State a few months before making the summary. Births registered, 15,934; marriages, 5497; deaths, 11,616. Rates per thousand of population, respectively: 22.27; 7.68; 16.23. Excess of births over deaths, 6.04. Divorces, 387—1 to every 14.2 marriages.

The Secretary reports for the month of April, 1888, the total number of deaths returned by 144 towns, comprising a

population of 689,436, 1116, representing an annual death-rate of 19.4, as against 20.00 for the preceding month.

Small-pox is credited with 2 deaths—out of 5 cases—in New Haven. Upon investigating its origin on the first report of its existence, two previous cases of varioloid had already occurred, run their course and were convalescent, without having been reported by the "doctor," who thought they were measles, and so declared them to the neighbors, and to whose ignorance the three subsequent cases, with two deaths, appear to be properly attributable. Besides these five cases, there were two others—one in Bridgeport—from New York, and one in Thompsonville; but, by being promptly reported to the health authorities, no spread of the disease was permitted in either case.

Diphtheria (and Croup) in 21 towns caused 39 deaths—the same number as in March, but the disease was more especially prevalent and fatal in New Haven (10 deaths) than elsewhere.

"Incredible as it must seem to the sanitary authorities of other cities, no law exists in the Town or City of New Haven, requiring the occurrence of dangerous contagious diseases to be reported to the Board of Health. It is still more remarkable that the Board of Health of New Haven is wanting in the authority (possessed by every other local board of health in Connecticut) to enforce such precautions against the spread of contagion as are necessary to protect the public. Hence it happens, when outbreaks of infectious diseases occur, only such protective measures are observed as may be undertaken voluntarily by the parties directly concerned. It is therefore not surprising that little local epidemics in the city, as the recent ones of small-pox and diphtheria, get well established before the Board of Health hears of them; and then it can only attempt by proffered advice and some assumption of authority to correct or arrest them."

Consumption had 150 victims—13.4 per cent of the total number of deaths from all causes.

The *lowest death-rates* of the 28 towns with 5000 inhabitants and upward were in Vernon, 10.5; Meriden, 12.5; Windham, 13.2; Stamford, 14.7; Derby and Killingly, each, 15.4.

The *highest death-rates* of the 28 towns with 5000 inhabitants and upward were in Stonington, 32.0; Manchester, 28.3;

Enfield, 22.3; Hartford, 21.6, and Stratford, 21.4. The average of the whole 28 towns was 19.8.

DELAWARE.—*Wilmington* (57,000) reports for the month of April 77 deaths, of which 33 were under five years of age. Annual death-rate per 1000, 16.21. From zymotic diseases there were 43 deaths, and from consumption, 11.

ILLINOIS.—*Chicago* (760,000) reports for the month of April 1420 deaths, of which 667 were under five years of age. Annual death-rate per 1000, 22.42.

From zymotic diseases there were 266 deaths, and from consumption, 130.

IOWA.—*Monthly Bulletin* reports for the month of April:

Davenport (30,084), deaths, 46; diphtheria, 8; consumption, 1. For the year ending March 1st, 469—from zymotic diseases, 94; consumption, 30.

Keokuk (14,000), 18—from consumption, 5. All but 4 were of persons over twenty years of age.

LOUISIANA.—*New Orleans* (248,000—white, 180,000, colored, 68,000) reports for the month of April 303 deaths among the whites and 164 deaths among the colored; showing the respective death-rates to be 20.20 and 28.93, and the rate for total population, 22.59. There were 162 deaths under five years of age.

From zymotic diseases there were 52 deaths, and from consumption, 77.

MARYLAND.—*The Seventh Biennial Report of the State Board of Health*, 1888, is a portly volume of 658 pages, to which His Excellency, the Governor, in submitting it to the State Legislature, pays the following well-merited tribute:

"Every precautionary measure possible has been taken by the State Board of Health to prevent disease from securing a foothold in the State, and as a result of its vigilant and systematic work we have had an unexampled exemption from diseases of all kinds.

"The seventh biennial report of the secretary of the board will exhibit the work which has been accomplished during the past two years ending December 31st, 1887. A number of valuable suggestions and recommendations are submitted for

the consideration of the Legislature. The first relates to the necessity of an efficient registration of all births and deaths occurring in the State. The registration of vital and mortuary statistics has become one of the necessities of civilized communities.

"In connection with the subject of vital registration the report recommends to the Legislature the importance of obtaining correct returns of the nature and extent of the sickness which prevails among various classes of our artisan and laboring population—facts which it is desirable to know, since it has been demonstrated that these classes of the population, more than any other, sustain unnecessary injury to their health for want of precautionary measures.

"One of the most important recommendations is in reference to the sale of adulterated and unwholesome articles of food, especially adulterated milk and diseased meats, and the power of the State is invoked to prevent the adulteration of the one and the sale of the other. The worst effect of adulterated milk is to be found among young children, who feed so largely on this diet; and there can be no doubt that the flesh of animals, more or less diseased, is constantly sold in our markets. Most of the States have laws to protect the people from such evils, but with us no effort has been made to discover the extent to which adulterations have been practised. Proper inspections will alone protect communities against such evils.

"Reference is made on page 44 of the Secretary's Report to the inefficiency of the existing law for the inspection of illuminating oils, and to the large number of serious accidents, deaths, and fires which annually occur from the use of such oils as emit a combustible vapor at the temperature of 120° Fahr. The Legislature is asked to so amend the law as to require a *flash* test, in an open cup, at from 125° to 130° Fahr., instead of the present *fire* test at 110° Fahr. This amendment is regarded as an indispensable provision against loss of life and property from coal oil explosions.

"Attention is called in the report to the necessity for a law to regulate the practice of medicine in the State. Many of the States in the Union, notably those adjoining Maryland, have enacted the most stringent laws in this respect. These

have had the effect of driving unfit professional men into this State. The propriety of enacting salutary laws for the regulation of the practice of medicine cannot be gainsaid.

"The inefficiency and pollution of the water supplies of some of the cities and towns of the State is fully discussed in the report, and the necessity of every community being supplied with an abundance of pure and wholesome water is urged as a health measure of the first importance. The value of this suggestion must be obvious to every one who has given any thought to the subject. Periodical pestilence often arises from a deficient or impure water supply, and fires can be checked only by sufficient supplies of water. The report, as a whole, is a valuable text-book, and I recommend the printing of twenty-five hundred copies for distribution among the people."

This worthy commendation of the Governor of the State is fully justified by the eminently practical detail of the work of the board throughout. Moreover, while it is evident that the Secretary and executive officer of the Board has devoted unusual attention and profound investigation to and of the most important questions of State sanitation and deduced therefrom practical conclusions of inestimable value, his associates in the board have heartily seconded his efforts and participated in them insomuch that with such an exemplification as this of the benefits of practical sanitation and the detriment of conditions in conflict with it, the Maryland State Board of Health may be very justly regarded among the foremost of such organizations and eminently worthy of the support which the accomplished Governor of the State invokes.

Baltimore (437,155). The Commissioner reports for the four weeks ending April 28th, 620 deaths, of which 236 were under five years of age; showing an annual ratio of 18.44 deaths per 1000.

From zymotic diseases there were 80 deaths, and from consumption, 97.

MASSACHUSETTS.—*Boston* (400,000) reports for the month of April 860 deaths, of which 266 were under five years of age. Annual death-rate per 1000, 25.8. From zymotic diseases there were 117 deaths, and from consumption, 141.

MICHIGAN.—The Secretary's report for the month of April,

1888, compared with that of the preceding month, indicates that tonsilitis, influenza, and bronchitis decreased in prevalence.

Compared with the preceding month, the temperature in the month of April, 1888, was much higher, the absolute humidity was much more, the relative humidity was much less, the day and the night ozone were about the same.

Compared with the average for the month of April in the nine years 1879–87, measles was more prevalent, and consumption of lungs, intermittent-fever, remittent-fever, diphtheria, pneumonia, bronchitis, and scarlet-fever were less prevalent in April, 1888.

For the month of April, 1888, compared with the average of corresponding months in the nine years 1879–87, the temperature was slightly lower, the absolute humidity, the relative humidity, the day ozone, and the night ozone were slightly less.

Including reports by regular observers and others, diphtheria was reported present in Michigan during the month of April, 1886, at 20 places, scarlet-fever at 43 places, typhoid-fever at 15 places, and measles at 45 places.

Reports from all sources show diphtheria reported at 5 places less, scarlet-fever at 10 places more, typhoid-fever at 2 places more, and measles at 4 places less in the month of April, 1888, than in the preceding month.

Sewer-gas and Typhoid-fever.—At the quarterly meeting of the board, April 10th, "Drs. Kellogg and Vaughan made a report concerning the outbreak of typhoid-fever at the State Industrial Home for Girls, at Adrian. The outbreak was attributed to the contamination of the air supply of the buildings with sewer-gas, and the infection of the sewer system by discharges from a patient sick with typhoid-fever, brought there from Sault Ste. Marie. This opinion was based on the testimony of managers and housekeepers and a large number of girls, as well as the personal observation of the committee. There were found to be grave defects in the sewerage system, which resulted in a pollution of the air of the whole building, endangering the lives of the inmates. This was probably increased by the stopping up by freezing of a rain-water conductor which was depended upon as a ventilator to the sewer.

The water supply was found to be good. In the sewer air there was found by Professor Vaughan a great abundance of bacterial growth; but after the first case the discharges of the typhoid patients had been disinfected, and no typhoid germs were found. Disinfection of the whole sewer system and opening up of the fresh-air inlets to the buildings was at once recommended by the committee. The outbreak stopped immediately, perhaps because of the disinfection after the first case."

Epidemic Pneumonia.—The Secretary read a communication from Dr. C. L. Randall, of Dansville, concerning an epidemic of pneumonia, perhaps complicated with meningitis, in the township of Bunker Hill, Ingham Co., with 22 cases and 5 deaths between February 18th and March 28th, 1888. The board authorized the secretary to inquire further into the epidemic.

A Sanitary Convention is announced to take place under the auspices of the State Board of Health, at Manistee, June 5th and 6th, Rev. J. Suarhall, Manistee, Secretary.

MINNESOTA.—*St. Paul:* Dr. Talbot Jones, Commissioner of Health, reports for the year ending December 31st, 1887: Population, 150,000; deaths, 1918; death-rate, 12.78—"the lowest death-rate among the cities of 100,000 population or over in the United States." Of the total number of deaths from all causes, 1078, or nearly 51 per cent, were of children under five years; 537, or 29 per cent, were caused by zymotic diseases—chiefly: Diarrhœal diseases, 244; typhoid-fever, 145; diphtheria and croup, 113—proportions unusually large for so low a death-rate, and suggestive of probable overestimate of population. Yet there has been a considerable decrease in the ratio of deaths from zymotic diseases, as compared with the preceding year: the evident result of energetic sanitary work in conflict with a good deal of surface filth and filth storage in default of more extensive sewerage, better plumbing, and improved means of garbage disposal.

Report for the month of April, 158 deaths, of which 86 were under five years of age. Annual death-rate per 1000, 12.48. From zymotic diseases there were 36 deaths, and from consumption, 7.

MISSOURI.—*St. Louis* (440,000) reports for the month of April 674 deaths, of which 242 were under five years of age. Annual rate per 1000, 18.4. From zymotic diseases there were 121 deaths, and from consumption, 75.

NEW HAMPSHIRE.—*Manchester* (41,000) reports for the month of April 57 deaths, of which 22 were under five years of age. Annual death-rate per 1000, 16.68.

From zymotic diseases there were 6 deaths, and from consumption, 7.

NEW JERSEY.—*Newark* (170,534) reports for the month of April 328 deaths, of which 129 were under five years of age. Annual death-rate per 1000, 23.01.

From zymotic diseases there were 53 deaths, and from consumption, 40.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 126 localities comprising an estimated population for the month of April, 1888, 8129—representing an annual death-rate per 1000 population of 21.73—of which 30.0 per cent were under five years of age. In each 1000 deaths, there were 150 from zymotic diseases; of which 13.95 were from diarrhœal diseases; 5.55 from typhoid-fever; 30.62 from scarlet-fever; 54.70 from diphtheria. There were 40 *deaths from small-pox*, 25 of which were reported from New York, 13 from Brooklyn, including those from the Kings County Hospital and one each from Albany and Cayuga. Single cases have been reported during the month at Amenia, Amsterdam, Yonkers, Sing Sing, and Munroe, Orange County; of localities previously reported, it exists only in Potsdam. From consumption there were 137.53 deaths in each 1000 total mortality, and 197.17 in each 1000 deaths above the age of five years. From acute respiratory diseases there were 164.32 deaths per 1000 total mortality.

New York City (1,526,081): Deaths, 2869, representing an annual death-rate of 22.87. Deaths under five years, 1108, 38.5 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 22; typhoid-fever, 11; malarial diseases, 20; small-pox, 25; scarlet-fever, 120; measles, 28; erysipelas, 15; whooping-cough, 25; croup and

diphtheria, 179; diarrhœal diseases, 63; zymotic diseases per 1000 deaths from all causes, 177.00. Consumption, 448; acute respiratory, 527; puerperal diseases, 31.

Brooklyn (757,755): Deaths, 1385; death-rate, 22.23; deaths under five years, 505—36.5 per cent of total. From zymotic diseases: Typhus-fever, 3; malarial diseases, 16; scarlet-fever, 59; measles, 3; erysipelas, 6; whooping-cough, 8; croup and diphtheria, 94; diarrhœal diseases, 17; zymotic diseases per 1000 deaths from all causes, 150.90. Consumption, 212; acute respiratory diseases, 267; puerperal diseases, 15.

Buffalo (202,818) for four weeks ending April 7th: Deaths, 380; death-rate, 21.47; deaths under five years, 169—44.5 per cent of total. From zymotic diseases: Cerebro-spinal meningitis, 4; typhoid-fever, 4; malarial diseases, 1; scarlet-fever, 6; measles, 3; erysipelas, 2; whooping-cough, 1; croup and diphtheria, 25; zymotic diseases per 1000 deaths from all causes, 126.32. Consumption, 44; acute respiratory diseases, 75; puerperal diseases, 2.

Rochester (110,000): Deaths, 164; death-rate, 17.90; deaths under five years, 52—31.7 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 2; croup and diphtheria, 9; zymotic diseases per 1000 deaths from all causes, 140.20. Consumption, 19; acute respiratory diseases, 12.

Albany (98,000): Deaths, 191; death-rate, 23.38; deaths under five years, 55—28.7 per cent of total. Deaths from zymotic diseases: Typhoid-fever, 3; small-pox, 1; scarlet-fever, 6; croup and diphtheria, 5; diarrhœal diseases, 5; zymotic diseases per 1000 deaths from all causes, 110.00. Consumption, 30; acute respiratory diseases, 28.

Syracuse (78,000): Deaths, 131; death-rate, 20.15; deaths under five years, 48—36.6 per cent of total. Deaths from zymotic diseases: Malarial diseases, 3; scarlet-fever, 1; measles, 2; croup and diphtheria, 3; diarrhœal diseases, 5; zymotic diseases per 1000 of total, 106.87. Consumption, 18; acute respiratory diseases, 22; puerperal diseases, 6.

Death-rates under 10 *per* 1000 population, and in the order of lowness as follows: Fort Ann (4267), 2.81; Boonville (4000), 3.00; Hector (5000), 4.80; Candor (4323), 5.24; Hamilton (3912), 6.20; Wolcott (5753), 6.26; Argyle (3700), 6.48; Hempstead (18,000), 6.67; Salem (3500), 7.00; Coble-

skill (3371), 7.12; Ellisburg (4811), 7.48; Johnstown (6000), 8.00; Worcester (3000), 8.00; Westfield (7000), 8.57; Richland (4000), 9.00; Canandaigua (6300), 9.52; Tonawanda (4900), 9.80.

Death-rates over 20 *per* 1000 population, and in the order of their highness as follows: Camden (3400), 42.35; Catskill (4500), 37.33; Delhi (3000), 36.00; Goshen (4387), 35.54; Northfield (7014), 35.13; Lansingburg (10,000), 34.80; Watertown (12,200), 31.47; Sing Sing (6500), 31.38; Binghamton (25,000), 30.72; Newtown (10,000), 30.00; Waterford (5400), 28.89; Gloversville (10,000), 28.80; Corning (8000), 28.50; Sag Harbor (3000), 28.00; Rome (12,045), 26.88; Fishkill (10,732), 26.83; Port Jervis (9550), 26.53; Hudson (10,000), 26.40; Ballston Spa (3200), 26.25; Jamaica (10,089), 26.13; Oyster Bay (12,000), 25.00; Fort Edward (4880), 24.59; Cortland (4361), 24.54; Lansingburg (6000), 24.00; Clyde (3000), 24.00; Newark (3500), 24.00; Ramapo (5000), 24.00; Amherst (4578), 23.56; Oswego (24,000), 23.50; Albany (98,000), 23.38; West Troy (13,000), 23.08; New York (1,526,081), 22.87; Palmyra (4800), 22.50; Cobleskill (14,000), 22.28; Amsterdam (14,000), 22.28; Brooklyn (757,755), 22.23; Yonkers (27,500), 21.82; Middleton (10,000), 21.60; Saratogo Springs (10,000), 21.60; Buffalo (230,000), 21.47; Penn Yan (4500), 21.33; Long Island City (21,000), 21.14; Saugerties (4000), 21.00; Fulton (4000), 21.00; Troy (65,000), 20.50; Baldwinville (78,000), 20.15.

OHIO.—As summarized in the *Monthly Sanitary Record*, the total number of deaths returned for the month of April, 1888, by 35 towns, comprising a population of 1,012,700, was 1384—representing an annual death-rate of 16.39. Deaths under five years of age, 517. From zymotic diseases, 198—the chief of which were diphtheria and croup, 51; typhoid-fever, 21; cerebro-spinal meningitis, 16; whooping-cough, 16; measles, 10—15 per cent. Consumption, 177—12.77 per cent.

Cincinnati (325,000), 468—death-rate, 17.28; under five years, 142; from zymotic diseases, 51: Typhoid-fever, 11; diphtheria and croup, 8; cerebro-spinal meningitis, 7. Consumption, 67—14.3 per cent.

Cleveland (225,000), 360—death-rate, 19.15; under five years,

178. From zymotic diseases, 66: Diphtheria and croup, 27. Consumption, 27—7.5 per cent.

Columbus (90,000), 105—death-rate, 14.00; under five years, 38; from zymotic diseases, 9. Consumption, 14—15.5 per cent.

Toledo (76,000), 95—death-rate, 18.25; under five years, 45; from zymotic diseases, 12. Consumption, 16—16.84 per cent.

Dayton (50,000), 83—death-rate, 19.92; under five years, 32; from zymotic diseases, 6—diphtheria and croup, 4. Consumption, 9—10.8 per cent.

The *lowest death-rates* were in Shelby (2500), 4.80; Wellington (2000), 6.00; Hudson (1700), 7.06; Galion (6500), 7.38; Wadsworth (2500), 9.60.

The *highest death-rates* were in Waverly (1600), 37.50; Defiance (7000), 29.14; East Liverpool (6000), 28.00; Youngstown (24,300), 27.77; Chagrin Falls (1400), 25.71.

PENNSYLVANIA.—*Philadelphia* (1,016,758) reports for the week ending April 7th 427 deaths, of which 130 were under five years of age; making the annual death-rate 21.9 per 1000. From zymotic diseases there were 37 deaths, and from consumption, 58.

Pittsburgh (210,000) reports for the four weeks ending April 28th 291 deaths, of which 132 were under five years of age, showing an annual death-rate of 18.0 per 1000. From zymotic diseases there were 26 deaths, and from consumption, 33.

Reading: Report of the Board of Health for 1887: Population, 55,500; marriages, 579; births, 557; premature and still-births, 116; deaths, 1002. Birth and death-rates, respectively, 28.05, 18.02; 463, or 46.2 per cent of the deaths, were of children under five years; 310, or 30.9 per cent, were caused by zymotic diseases—chiefly: Infantile diarrhœa, 85; measles, 79; diphtheria and croup, 75; typhoid-fever, 19; scarlet-fever, 10. Deaths from consumption, 102—10.17 per cent of total mortality. Filth storage, stagnant ponds, wet cellars, and surface filth are the chief subjects with which the board has had to contend, because, in Reading, as elsewhere, dearer to some people than health and life.

TENNESSEE.—The State Board *Bulletin* reports the principal diseases, named in the order of their greater prevalence in the State, for April, were lung diseases, acute, malarial fevers, consumption, catarrhs, rheumatism, tonsillitis, diarrhœa, erysipelas, and dysentery.

Measles are reported in the counties of Blount, Bradley, Cocke, Davidson, Franklin, Gibson, Hancock, Hardeman, Hardin, Lake, Lewis, Madison, Marshall, McMinn, Moore, Obion, Shelby, Stewart, and Weakley.

Typhoid-fever in Davidson, Fayette, Fentress, Hamilton, Humphrey, James, Knox, Montgomery, Overton, Pickett, Shelby, Sumner, and Wayne.

Mumps in Blount, Carroll, Cocke, Franklin, Grundy, Hancock, Lawrence, Marshall, Maury, Moore, Stewart, and Sullivan.

Whooping-cough in Davidson, Fentress, Franklin, Hardeman, Humphreys, Marshall, Sumner, and Williamson.

Scarlet-fever is reported in Davidson, Knox, Lake, Robertson, and Williamson.

Diphtheria in Hamilton, Knox, Montgomery, and Shelby.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows:

Chattanooga,	white,	12.00;	colored,	30.46 :	18.48
Clarksville,	"	16.80;	"	20.00 :	18.00
Columbia,	"	8.00;	"	12.00 :	9.60
Knoxville,	"	10.19;	"	31.53 :	14.58
Memphis,	"	15.81;	"	32.53 :	21.75
Nashville,	"	14.53;	"	20.56 :	16.75
Tullahoma,	"	4 60;	"	20.00 :	3.75

The *meteorological* features of April were the severe electric storms of the 9th and 22d in the middle division, the small proportion of rainfall during the second decade, and the small percentage of cloudiness.

The mean temperature was 61.4°, nearly three degrees above the April mean for the past six years, and the highest during that period.

Necessity for a Bureau of Public Health—At the quarterly meeting of the board, April 24th, Dr. Plunket offered the following preamble and resolution, which, upon motion, was adopted:

Whereas, During the recent past preventive medicine has made marked progress in the United States, as is shown in the fact that now only a small minority of the States are without State boards of health, and all the cities of the Union have well-organized municipal health boards; and,

Whereas, The necessity now exists for a central Bureau of Public Health, possessed of ample authority and funds, which shall gather together at short intervals of time and properly interpret the mortality and morbility statistics as may be supplied by these several State and municipal boards, and which shall furnish reliable information regularly of epidemic diseases as they may prevail in foreign countries, and give timely warning of the approach to or arrival upon the shores of America of any epidemic diseases, and which shall especially be charged with the duty of investigating the ultimate cause of all communicable diseases, and the best means of preventing both the origin and spread of the same; therefore, be it

Resolved, That the Tennessee State Board of Health do cordially endorse the bill pending in Congress, entitled, "A bill to prevent the introduction of contagious and infectious diseases into the United States, and to establish a bureau of public health." [H. R. bill 1526, 50th Congress, 1st session.]

Resolved, That the secretary be and is hereby directed to mail to each Senator and representative in Congress from Tennessee a copy of this preamble and resolutions.

VIRGINIA.—*Richmond* annual report of the Health Department for 1887: Population—white, 56,000, colored, 44,000: 100,000. Marriages—white, 382, colored, 312: 694. Births, the number reported so incomplete as not to be deemed worthy of publication. "Baby farming is still one of the institutions of our city, the evil consequences of which are sadly depleting the infant population." Deaths—white, 889, colored, 1136: 2025. Under five years—white, 319, colored, 509: 828, or, respectively, 35.85 per cent of whites and 44.8 per cent of colored. 421—24.63 per cent of whites and 17.78 per cent of colored—were cause by zymotic diseases, showing a greater prevalence of this class of disease among the white than among the colored population. From pulmonary consumption, on the other hand—89 white and 129 colored—the mortality is 1.3 per cent greater among the colored than among the white; and the respective death-rates of total mortality—white, 15.87, colored, 25.82: 20.25. Deficient sewerage, defective plumbing and neglected sewer connections,

filth storage and contamination of wells—still used to a dangerous extent—are still urged, as they have been for several years, as the prevailing sources of preventable diseases, requiring more stringent laws for their abatement.

WISCONSIN.—*Milwaukee* (185,000) reports for the month of April 278 deaths, of which 65 were under five years of age. Annual death-rate per 1000, 18.00. From zymotic diseases there were 37 deaths, and from consumption, 35.

INFECTIOUS DISEASES ABROAD.

Yellow-fever (from Surgeon-General Hamilton's Abstract of Consular Reports).—Trujillo, Venezuela: The U. S. Consul, in his despatch of April 27th, 1888, states that "for several months past the section Trujillo, of the State of Los Andes, a mountainous region lying to the southwest of Maracaibo, has suffered severely from yellow-fever, and recently the disease has made such progress as to almost decimate the population and cause the virtual abandonment of various thriving towns, among them notably the city of Trujillo, capital of the section of the same name, and one of the most important centres of the State."

Havana: During the week ending May 5th, 6; during the week ending May 26th, 5.

Cienfuegos: During the two weeks ending May 14th, 2.

Pernambuco: During the week ending May 14th, 1.

Small-pox continues to prevail abroad, but somewhat less extensively than it did a month ago. The number of deaths from it, according to most recent reports, is as follows:

During the four weeks ending May 26th: Havana, 27.

During the five weeks ending May 21st: Cienfuegos, 21.

During the four weeks ending May 19th: Leeds, 1; Manchester, 1; Sheffield, 24; Bristol, 4; Hull, 1; Anvers, 1; Mons, 1; Jumet, 1; Wasmes, 1; Jemappes, 19; Hamme, 1; Fleurus, 1; Paris, 26; Havre, 18; Rheims, 6; Bucharest, 4.

During the four weeks ending May 12th: Prague, 56; Vienna, 12; Warsaw, 14.

During the three weeks ending May 5th: St. Petersburg, 4.

During the month of April: Marseilles, 10; Nantes, 2; Rouen, 4; Nice, 3; Lyons, 2.

During the month of March: Milan, 43; Genoa, 19; Bologne, 1; Besançon, 1; Bayou, 1; Calcutta, 111.

During the four weeks ending April 10th: Rome, 9.

During the month of February: Madrid, 58; Saragossa, 2; Murcie, 6; Carthagena, 9; Buenos Ayres, 81.

Cholera.—Calcutta: During the four weeks ending April 14th, 1888, the number of deaths reported from cholera was 266.

Bombay: During the three weeks ending April 24th, the number of deaths reported from cholera was 26.

Madras: During the week ending April 6th, the number of deaths reported from cholera was 15.

Valparaiso, Chili (from Surgeon-General Hamilton's Abstract of Consular Reports): The U. S. Consul, in his despatch of March 17th, 1888, says, from all he can learn, cholera was unknown in that country in its epidemic form until last year. On the estimates of physicians in good standing, the number of deaths from it in Valparaiso, alone, during the year, was from 3000 to 5000; and in the whole country 60,000. And "I consider it my duty," he remarks, "to refer in this despatch to the fact that the certificates of health from the office of the captain of the port are altogether untrustworthy."

Palermo, Italy: The U. S. Consul, in his despatch, May 9th, 1888, relative to his reports on cholera of last year, states: "I am of opinion that the disease has again manifested itself in this city. This opinion is based on the large number of deaths from 'intestinal catarrh,' a term almost synonymous with cholera in Palermo, in view of the initial cases of that disease being thus designated by the authorities (in order to prevent a panic) in recent epidemics, as well as upon the fact that the messenger to the consulate was attacked last night by so-called intestinal catarrh, and is now confined to his bed."

Measles continues to prevail in most of the European cities, as reported in May number, but somewhat less fatally since the beginning of warm weather. During the four weeks ending May 19th, the number of deaths reported from this cause was, in London, 70; Glasgow, 31; Belfast, 17; Paris, 45; Rheims, 40. During the four weeks ending May 12th, Berlin, 26; Hamburg, 33; Strasburg, 41; Pesth, 20; Vienna, 18;

Prague, 42. During the *week* ending May 5th, St. Petersburg, 41. During the month of April, Marseilles, 54.

Scarlet-fever continues prevalent in London. During the four weeks ending May 19th, the number of deaths reported from it was 68.

Whooping-cough, also, is increasingly prevalent and fatal in London, causing, during the four weeks ending May 19th, 283 deaths—one fourth more during the last week than the first.

Diphtheria (and croup) caused 113 deaths during the same interval (four weeks ending May 19th) in London, and in Paris 190.

Death-rates in foreign cities per 1000 of population per annum for the three months ending March 31st, as follows:

London, 21.9; Liverpool, 22.2; Glasgow, 26.2; Birmingham, 20.1; Manchester, 28.9; Dublin, 30.3; Leeds, 21.0; Sheffield, 23.8; Edinburgh, 22.0; Bradford, 18.1; Belfast, 34.1; Bristol, 20.3; Hull, 18.1; Newcastle, 22.0; Brusselles, 25.3; Anvers, 24.2; Gand, 28.2; Liege, 21.5; Bruges, 29.2; Malines, 25.1; Berviers, 18.7; Louvain, 24.0; Tournay, 22.7; Seraing, 25.0; Borgerhout, 20.0; Mons, 28.7; Jumet, 25.2; Alost, 28.5; Charleroy, 18.1; Roulers, 28.8; Amsterdam, 26.6; Rotterdam, 29.0; Hague, 24.2; Paris, 26.4; Lyons, 26.8; Marseilles, 33.4; Bordeaux, 29.7; Nantes, 30.2; St. Étienne, 30.2; Havre, 38.2; Rouen, 42.0; Rheims, 35.1; Nancy, 24.3; Amiens, 27.7; Nice, 32.1; Besançon, 25.6; Berlin, 20.2; Hamburg, 28.8; Breslau, 28.3; Munich, 28.2; Dresden, 21.9; Leipsig, 19.9; Cologne, 24.0; Magdeburg, 22.7; Frankfort, 21.1; Koenigsberg, 26.6; Hanover, 12.2; Dusseldorf, 20.4; Nuremberg, 27.9; Bremen, 19.3; Chemnitz, 37.3; Dantzig, 27.2; Stuttgart, 19.9; Strasburg, 27.7; Elberfeld, 19.7; Altona, 29.2; Barmen, 20.6; Aix-la-Chapelle, 22.7; Mayence, 23.5; Metz, 27.2; Bale, 17.8; Geneva, 15.9; Berne, 29.3; Lausanne, 24.1; Zurich, 13.3; Chaux-de-Fonds, 19.4; Vienna, 26.8; Pesth, 34.8; Prague, 34.3; Trieste, 38.1; Debreczin, 30.5; Presburg, 39.7; Copenhagen, 24.1; Stockholm, 24.1; Gothenberg, 21.8; Christiania, 26.6; Helsingfors, 20.4; St. Petersburg, 31.3; Odessa, 23.5; Venice, 33.0; Bucharest, 32.8; Jassy, 31.9; Cairo, 38.3; Alexandria, 38.8; Suez, 29.7; Port Said, 29.0.

MORTALITY AMONG THE JEWS.—The prevalence of longevity in the Jewish race has long been recognized in a general way. In the last number of the *Institute Journal*, Mr. Sprague gives a table of the rates of mortality found to prevail among the population of Buda-Pesth when classified according to their religious creeds. The table is quoted from a publication of Mr. Joseph Korosi in 1876, and is as follows, omitting the younger ages :—

Ages.	Romish.	Reformed.	Jewish.
20–24.....	1.70	2.36	1.19
25–29.....	1.74	2.16	.88
30–34.....	1.94	2.72	.67
35–39.....	2.36	2.54	1.01
40–44.....	2.89	3.03	1.17
45–49.....	3.44	3.53	1.42
50–54.....	4.01	4.03	2.14
55–59.....	4.32	3.44	2.64
60–64.....	5.65	5.83	4.10
65–69.....	8.58	7.59	5.64

The Jewish mortality corresponds closely in a general way with Farr's table of male life in England. Whether its relative superiority over that of the other classes is due more to race or occupation is difficult to say. The majority of the working classes in Buda-Pesth according to the author are Protestants, and in another table he shows that the mortality among the trading classes is much more favorable than among the workmen. The great superiority of the Jew may be due to the fact that he is a trader.

LITERARY NOTICES.

THE NATURAL HISTORY OF PLAGUES, by R. B. S. HARGIS, M.D., Pensacola, Fla., is a brochure of eleven pages, the subject of an address before the Florida Medical Association, especially laudatory of the natural sanitary advantages of Florida, but, at the same time, averring that "there is no spot on earth where endemics or indigenous diseases can be better studied; none where the absolute exclusion of pestilence *better reveals the exotic character of true plagues*. We can

trace isolated centres of pernicious fevers, as virulent and fatal as the malaria of the Roman Campagna or the allied maladies of the Gold Coast. But so circumscribed and isolated are these *foci*, that the State as a whole stands, probably, *unrivalled in this Union for small mortality and striking longevity.*" This is strong language, considering the circumstances and the learning of the author of this pamphlet. It might go without saying that the sparcity of the population of Florida (considering the area), its freedom from dense centres, and its avoidance of the well-recognized *foci*, by settlers as well as by the author, much better account for the low rate of mortality than the natural conditions to which he refers. That there are *portions* of Florida of remarkable salubrity is beyond question, but that these portions should be held up as the general characteristic of the whole State, as they too often are by speculators in Florida's swamp lands, or that these deadly swamps should be ignored by intelligent observers, are propositions alike deceptive and mischievous in their results. Dr. Hargis is by no means blind to these conditions, but the fallacy of his reasoning is misleading to persons of less knowledge. He quotes, approvingly, the words of Dr. Babbington, the translator of Hecker's "Classical Memoirs of the Epidemics of the Middle Ages," that "We are constantly furnished with proofs that that which affects life is not itself alive." To this he adds: "Since those words were written, the tendency has been to trace every malady to distinct organic germs. They have not been traced, and resist chemical analysis, physical or microscopic identifications, such as we insist upon in natural history classifications. With Dr. Babbington, I may say, that to assume 'Causes, of whose existence we have no proof, in order to account for effects, which, after all, they do not explain, is making no real advance in knowledge, and cannot be considered otherwise than an indirect method of confessing our ignorance.' . . . Our experiences in Florida are but repetitions of those elsewhere. We know that in our swamps and on our river-banks the most fatal endemics may be localized, but, as a rule, natives enjoy immunity from pernicious periodic fevers until cultivation started, by the upturning of the soil, the most manifest and virulent of these diseases." But he should have added to this, as another and an excellent rule, very few persons even try to live in these swamps,

and, consequently, the number of natives amid them is proportionally small. In this production, as in much that he has written heretofore, he reiterates his belief "that yellow-fever is the genuine naval endemic of the Equatorial Atlantic. . . . Endemic on no land, though through defective sanitary measures and geographical position it clings perennially to certain ports, such as Havana and Vera Cruz."

WASTED SUNBEAMS is the reprint of an interesting contribution to a recent number of the *Medical Record*, by Gouverneur M. Smith, M.D., of New York, giving a historical sketch of the use to which certain nomadic tribes in ancient times turned the roofs of their houses in the cultivation of flowers; cites the "Solarium" of the New York Hospital, made attractive with its plants, birds and aquaria, as a potent ally in restoring the convalescents, and the contagious sparkle of the sunbeam shining in the eyes and lives of the young patients at the Hospital for the Relief of the Ruptured and Crippled. Our attention has before been invited to the same subject, with some beautiful examples of it; particularly several years ago by Dr. William C. Van Bibber, of Baltimore, who conducted us through a door-hinged window from the second story of his dwelling into a delightful parterre on the roof of his kitchen and other outbuildings. The same practice is cultivated more or less, and has been for many years, by the residents on Columbia Heights, Brooklyn. But these examples only demonstrate the practicability of Dr. Smith's suggestions for its more general adaptation. He remarks: "Cannot architectural ingenuity, coached by sanitary science, contrive some method of using the thousands of acres of housetops on this island so that roofs, now so useful in affording indoor protection from cold, sleet, and rain, can be made additionally useful, at certain seasons, by affording outdoor recreation and protection from invalidism? Architects have merely to study ancient history and modern science to utilize the suggestions here made."

Akin to it, we again invite attention to the importance of letting in the sunshine into the back yards of city houses. The prison-like close fences to a large proportion of the most costly and otherwise most elegant mansions of New York and Brooklyn are only so many obstructions to sunshine and cul-de-

sacs of stagnant air that ought to be done away with. This subject, too, was cleverly discussed by Dr. Van Bibber in our pages several years ago (vol. 6) in a paper on ventilation.

THE PATHOLOGY, DIAGNOSIS, AND TREATMENT OF THE DISEASES OF WOMEN. By GRAILY HEWITT, M.D., London, F.R.C.P., Professor of Midwifery and Diseases of Women, University College, and Obstetric Physician to the Hospital; formerly President of the Obstetrical Society of London; Honorary Fellow of the Obstetrical Society of Berlin; Honorary Fellow of the Gynæcological Society of Boston. A new American from the Fourth Revised and Enlarged London Edition. Edited, with Notes, Additions, and Illustrations, by H. MARION-SIMS, M.D., Attending Surgeon to St. Elizabeth's Hospital, N. Y., etc. In three volumes, handsomely bound, pp., respectively, 350, 322, 362, profusely illustrated. $2.75 each: the Seventh, Eighth, and Ninth volumes of "Treat's Medical Classics." E. B. Treat, publisher, 771 Broadway, New York.

It may seem superfluous to say a word in commendation of Dr. Graily Hewitt's great work—a work which has been accepted as *the* standard by the profession both in England and America, and which has been adopted as a text-book in twenty or more medical colleges. The author, in the preface, says:

"Ten years have elapsed since the last edition of this work was published. What I have gained from observation and experience during these ten years has been here faithfully and truly set down. . . . The greater part of this new edition has been rewritten."

Dr. Sims has fully comprehended the advances made in America during the while, and has in such wise added his notes (in brackets) as to improve the text and render the work complete to date.

ATLAS OF VENEREAL AND SKIN DISEASES. By PRINCE A. MORROW, A.M., M.D., Clinical Professor of Venereal Diseases; formerly Clinical Lecturer on Dermatology in the University of the City of New York; Surgeon to Charity Hospital, etc. Imperial folio atlas, to consist of fifteen parts containing seventy-five chromo-lithographic plates, containing several hundred figures, many of them of life size, in flesh tints and colors, together with descriptive text for each plate, and from

sixteen to twenty folio pages of a practical treatise upon venereal and skin diseases; the whole to form one volume. In the composition of the work, besides Professor Morrow many of the most distinguished authorities on the subjects treated of have been secured as contributors; among them Kaposi and Neumann, of Vienna; Hutchinson, Fournier, and Hardy, of London; Ricord, Cullerier, Besnier, and Vidal, of Paris; Leloir, of Lille; Keyes, Fessenden, and Piffard, of New York; Hyde, of Chicago, and others.

Fasciculi IV. and V., now before us, contain plates (IV.) of the Miliary Papular Syphilidæ, Lenticular Papular Syphilidæ, Nummular Syphilidæ, Papulo-Squamous Syphilidæ; (V.) Annular Syphilidæ, Chancre of Lip, with Generalized Pustular Syphilide, Large Pustular Syphilide, Syphilis Cutanea Ulcerosa, and Rupial Syphilide—Different Stages of Pustulo-Crustaceous Syphilide. Illustrated, respectively, with five large plates of groups of life-like figures, showing these diseases in their various forms, in conjunction with full descriptive text on diagnosis, pathology, and treatment by the most distinguished authorities on the several subjects considered. Moreover, that portion of the text devoted to a description of the anatomical structures of the syphilitic papule and the broad condyloma, taken from Kaposi, is illustrated with unusually fine wood-cuts, showing the minute structure of the tissues described with remarkable clearness and exhaustive comprehensiveness.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES—AN ATLAS AND TEXT-BOOK COMBINED. By GEORGE HENRY FOX, A.M., M.D., Clinical Professor of Diseases of the Skin, College of Physicians and Surgeons, New York; Professor of Diseases of the Skin, Post-Graduate Medical School and Hospital, New York; Physician to the New York Skin and Cancer Hospital; Fellow of American Academy of Medicine; Member of the New York Dermatological Society, the American Dermatological Association, etc. Second Series, complete in twelve parts. Hand-colored plates; nearly one hundred cases from life. 4to. To be published in twelve monthly parts, $2 each. New York: E. B. Treat. Fasciculi 3, 4, 5, and 6 of this work now before us fully justify what we said of its excellence in reviewing the first fasciculi received, 1 and 2, in a pre-

vious number. These Parts contain life-like plates and treat, respectively, (3) of Eczema rubrum-squamosum-intertrigo-faciei; (4) Eczema barbæ-squamosum-syphiloderma, Sycosis barbæ-guttata, Tricophytosis barbæ, Dermatitis exfoliativa; (5) Psoriasis nummulata-annulata-diffusa-manum-pedum; (6) Lichen planus-ruber, Pityriasis circinata, Herpes facialis, Zoster frontalis-lumbo-femoralis. The text is alike admirable for completeness with the plates, and the work is altogether commendable for its excellence.

LESIONS OF THE VAGINA AND PELVIC FLOOR, with Special Reference to Uterine and Vaginal Prolapse. By B. E. HADRA, M.D., Austin, Tex. 12mo, pp. 339, with 83 Illustrations. Philadelphia: Records, McMullen & Co.

This is a concise manual of much practical importance to all obstetricians and gynæcologists with a view to preventing, as well as repairing injuries to which all child-bearing women are more or less liable. It is the better for excluding all mere historical material and being exclusively confined to the description of the symptoms and treatment of malpositions, injuries and operations of and upon the urogenital organs under the light of the most recent advances in this branch of medicine.

MINERAL WATERS, AND THE CLASSIFICATION OF MINERAL WATERS. By A. C. PEALE, M.D., United States Geological Survey, Washington, D. C. Two brief pamphlets, which exhibit a good deal of research and much practical information on a subject of increasing importance to the people of the United States, and to physicians in particular.

THE NATURE OF CONTAGION. By J. W. MCLAUGHLIN, M.D., Austin, Tex. A reprint of eight pages contributed to *Daniels's Texas Medical Journal*, urging the germ theory of disease.

TO WHAT EXTENT CAN WE CLASSIFY VESICAL CALCULI FOR OPERATION? By A. VANDERVEER, M.D., Albany, N. Y. Reprint from the Transactions of the American Surgical Association, 1887. A pamphlet of forty-eight pages, illustrated by the citation of numerous cases in the author's own

practice, and tabulated statistics of sixty-four cases in the practice of others, with the results in all cases, and such information from actual observation and collation as all surgeons will highly esteem.

THE CORSET: QUESTIONS OF PRESSURE AND DISPLACEMENT. By ROBERT L. DICKINSON, M.D., Brooklyn, N. Y. A pamphlet of thirty-three pages, reprinted from the *New York Medical Journal.* Some new ideas on an old subject, sustained by such scientific demonstration as all physicians should be fortified with for the good of their patients.

SUPRA-PUBIC LITHOTOMY: A HISTORICAL SKETCH. By CHARLES W. DULLES, M.D., Surgeon to Out-Door Department in the Hospital of the University of Pennsylvania and in the Presbyterian Hospital, Philadelphia, Pa. A pamphlet of eight pages, reprint from the Transactions of the Medical Society of the State of Pennsylvania, 1887.

THE PROPHYLACTIC: A PRACTICAL HEALTH JOURNAL, is a new name to the whilom "Sanitary Journal," "Canada Health Journal," and "Man," under which it appears to have vainly sought during the last ten years a title sufficiently captivating to make it a paying enterprise to its worthy editor and proprietor, Dr. Edward Playter, Ottawa, Can. It has by no means been wanting in useful information promotive of public health heretofore, and while we can conceive of no reason why its new name is likely to increase its popularity, it gives us pleasure to say that no person interested in the subject will go amiss by giving it a helping hand. It is now published by M. B. Playter & Co., with an office at Brentano's, 5 Union Square, New York. Forty pages, monthly, $1.75 per annum.

THE TEXAS HEALTH JOURNAL is the title of a new monthly periodical which will be issued at Dallas, on or about July 1st, by the Health Journal Publishing Company. The new journal will be under the editorial management of Dr. J. R. Briggs, formerly associate editor of the *Texas Courier Record of Medicine*, assisted by able writers from all parts of the country, but more especially from that great State which is an empire in

itself. The style of the new journal is to be large octavo in form, each number containing forty-eight pages of reading matter. Dr. Briggs brings considerable experience to the management of the work in hand, and with the enterprise and push of his business lieutenant, Mr. Richard Flood, will doubtless give those who favor them with their patronage a journal first class in every respect. The price has been fixed at $2.00 per annum.

THE POPULAR SCIENCE MONTHLY for June has an article on *The Effects of Moderate Drinking*, by George Harley, M.D., in which the author records the effect of "nipping" upon the liver, kidneys, heart, and brain, the organs which medical science has shown to be chiefly affected by the use of alcohol in moderate quantities. It is eminently worthy the attention of all *nippers*.

An article is promised for July number which ought to, as it doubtless will, attract general attention—*Safety in House Drainage*, fully illustrated, by William E. Hoyt, S.B., in which the belief indulged by some persons that plumbing fixtures in our houses are inevitable sources of danger is controverted, and ways are shown for making them wholly safe.

THE CENTURY has printed several articles of timely interest to students of the International Sunday-school Lessons recently. The July number is to have another of these papers, written by Mr. EDWARD L. WILSON, and illustrated with engravings made from his photographs. It will describe a journey from the Red Sea to Mount Sinai, following the course which is supposed to have been taken by the Children of Israel, and will include a description of the ascent of the mountain. Among the illustrations are a view of the site of the battle between Israel and Amalek and of the Plain of Assemblage as seen from the Rock of Moses on Mount Sinai.

EXECUTION IN CAPITAL CASES: Report of the Commission to Investigate and Report upon the most Humane and Practical Method of Carrying into Effect the Sentence of Death in Capital Cases. Eldridge T. Gerry, Alfred P. Southwick, and Matthew Hale, Commissioners. Transmitted to the Legislature of the State of New York January 17th, 1888. A methodical report of one hundred pages, giving a historical sketch

of the different modes of capital punishment by different people, in all ages, together with the opinions and criticisms of scientific and sentimental writers on the subject. It concludes with a draft of the proposed law, which has been enacted, substituting electricity for hanging, and extending the period of the judgment fixing a day to a week within which the sentence must be executed, prohibiting public announcement of the hour or day and public executions, limiting the number of persons allowed to be present to the agent and warden of the prison, a justice of the Supreme Court, the District Attorney and the Sheriff of the County, together with two physicians and twelve reputable citizens, to be selected by said agent and warden ; and, at the request of the criminal, such mininsters of the Gospel or priests, not exceeding two, to be present at the execution ; in addition, seven assistants or deputy sheriffs may be permitted, and no other persons. To the influence of this report is probably due the enactment of the law referred to on another page, substituting electricity for hanging in the State of New York.

CANCER, by C. R. EARLEY, M.D., Ridgway, Pa., a paper read before the Tycoming County Medical Society, is a concise sketch of cancer without details, illustrated by several cases variously treated, with the usual results.

THE MEDICAL JURISPRUDENCE OF INEBRIETY, by JOSEPH PARISH, M.D., Burlington, N. J., is a brochure of seven pages, from the *Journal of Inebriety:* confined to "*Inebriety the disease,*" in contradistinction from other forms of alcoholism, upon which his conclusion is "that inebriates should not be punished for acts committed while in a state of involuntary unconsciousness any more than somnambulists and epileptics are for the same acts under like conditions."

EDUCATION IN BAVARIA, by Sir PHILIP MAGNUS, Member of the late Royal Commission on Technical Instruction, Director of the City and Guilds of London Technical Institute, is the subject of an essay, of interest to all educators, published by the *Industrial Education Association*, 9 University Place, New York, which is engaged in publishing Educational Monographs in a bi-monthly periodical devoted to the purpose, at $1.00 per annum.

THE LOMB PRIZE ESSAYS.

No. 1. Healthy Homes and Foods for the Working Classes. By Victor C. Vaughan, M.D., Ph. D.

No. 2. The Sanitary Condition and Necessities of School-Houses and School Life. By D. F. Lincoln, M.D.

No. 3. Disinfection and Individual Prophylaxis against Infectious Diseases. By George M. Sternberg, M.D., United States Army.

No. 4. The Preventable Causes of Disease, Injury, and Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding Them. By George H. Ireland.

These essays have been extensively reviewed and received the hearty commendation of THE SANITARIAN and many other periodicals devoted to the preservation of health. They are not speculative disquisitions on theoretical questions concerning modes of life, but plain, intelligible lessons of the most practical character, relating to the homes we live in, the food we eat, the care of our children in their school life, the means of protection from disease, and the avoidance of the special dangers of our work-shops and factories. They are all matters of every-day concern—matters in which all classes and all communities are directly or indirectly deeply interested.

The most successful philanthropy, that which really extends its usefulness most widely and most efficiently, is of the sort which, in a practical and direct manner, enables large numbers, whole classes of people, to help themselves in a way which they could not do or did not know how to do before. Such is the aim and purpose of Mr. Henry Lomb, the originator of these prize essays. As their titles indicate, they are devoted to the consideration of subjects most deeply and intimately connected with the daily life of the American citizen, and more especially of the wage-earner.

The prices are as follows: No. 1, 10 cents; Nos. 2, 3, and 4, 5 cents each. In book form, well bound in cloth, 50 cents. To be had at the bookstores, or by addressing Dr. Irving A. Watson, Secretary American Public Health Association, Concord, N.H., or of the American News Company, New York.

INDEX.

Abbott, A., LL.D., Physiology of the Rogue, 289.
Antisepsis, The most Important, L. Barkan, M.D., 530.
Associations, Conventions, etc.: American Medical Association, 361, 534; American Medical Editors' Association, 362; Ohio State Sanitary Association, 193, 385; Resolutions, etc., 459.
Asylums, Orphan, and Children's Homes, Darby, 223.

Bacilli in Salt Water, 542.
Balch, L., M.D., Relations of Physicians to Boards of Health, 303.
Barkan, L., M.D., The most Important Antisepsis, 530.
Barnhill, J. U., M.D., Cadaveric Alkaloids, 417.
Beardsley, C. E., M.D., Should Syphilis be made a Legal Bar to Matrimony? 445.
Beckwith, D. H., M.D., Cholera—Its Prevention and Limitation, 433.
Best Education, 528.

Cadaveric Alkaloids, Barnhill, 417.
Cancer in Medical Examinations for Life Insurance, Mauriac, 24.
Carmichael, H., Ph.D., Significance of a Sanitary Analysis of Water, 154.
Chaillé, S. E., M.D., Public Filth is Public Disgrace, 529.
Chesney, J. A., M.D., Meat Poisoning, 412.
Cholera, 78, 188, 285, 379, 477, 561.
Cholera—Its Prevention and Limitation, Beckwith, 433.
Cinchona-Bark Alkaloids, Increasing Consumption of, Cox, 70.
Climate as a Therapeutic Agent in Phthisis, Lindsay, 26.
Collamore, G. A., M.D., Duty of the Public to Sanitary Science, 385.
Contagious Disease, Should not the Government Defend us from? Lee, Benjamin, M.D., 510.
Contempt of Court, 316.
Cox, W. T. H., Increasing Consumption of Cinchona-Bark Alkaloids, 70.
Cremation as a Sanitary and Economic Measure, Slusser, 452.

Darby, F. H., M.D., Children's Homes and Orphan Asylums, 223.
Death-Rate, The, Reflections on, Haughton, 22.
Diphtheria, Deadly Contagion of, 510.
Drainage, House, and Sewerage Connections, Owens, 238.
Dujardin-Beaumetz, M.D., Hygienic Therapeutics, 317.
Disinfection in Quarantine, 542.

Education, Best, 528.
Education in the United States, Report, 57, 108.
Electricity to Supersede Hanging in New York, 544.
Epidemics, International Regulation of, Sonderegger, 309.

Filth, Public Disgrace of, Chaillé, S. E., 529.
Foods and Food Adulterations, Vaughan, 396.

Hamilton, Hon. J. Kent, Address before Ohio State Sanitary Association, 193.
Haughton, S., M.D., Reflections on the Death-Rate, 22.
Health Board Organizations, Report, 144.
Health, Boards of, and Health Laws, Relations of Physicians to, Balch, 303.
Health, Village Boards of, Hutt, 419.
Health, Conditions of, Simpson, 390.
Hull, A. G., Mission of the Science of Medical Jurisprudence, 97.
Hutt, A., M.D., Village Boards of Health, 419.
Hygiene of the Sick-Room, Larimore, 220.
Hygienic Therapeutics, Dujardin-Beaumetz, 317.

Illiteracy, 71.
Infectious Diseases Abroad, 473, 560.

Jews, Mortality among the, 563.

Larimore, F. C., M.D., Hygiene of the Sick-Room, 220.
Lee, Benjamin, M.D., Should not the General Government Defend our Ports against Contagious Disease? 510.
Life Insurance, Cancer in Medical Examinations for, Mauriac, 24.
Lindsay, M. A., M.D., Climate as a Therapeutic Agent in Phthisis, 26.
Literary Notices:
American Journal of Psychology, 288; Atlas of Venereal and Skin Diseases (Morrow), 286, 381, 566; *Book Chat*, 383; *Brooklyn Medical Journal*, 288; Cancer (Earley), 571; *Century Magazine*, 94, 570; Cholera and Water in India (Furnell), 382; Contagion (McLaughlin), 568; Cyclopædia of American Contemporary Biography, 92; Corset (Dickinson), 569; Diseases of the Heart (Clark), 381; Diseases of the Heart and Lungs (Leaming), 191; Diseases of the Skin (Shoemaker), 287; Diseases of Women (Hewitt and Sims), 566; Education in Bavaria (Magnus), 571; Execution in Capital Cases, 570; Handbook of Treatment (Aitken), 94; Heads and Faces (Sizer), 384; Health Lessons (Walker), 93; Inebriety, Medical Jurisprudence of (Parish), 571; Lesions of Vagina and Pelvic Floor (Hadra), 568; Ledger of Monthly Balances, 191; Lithotomy (Dulles), 569; Mineral Waters (Peale), 568; Modern Houses at Low Cost (Shoppell), 382; Natural History of Plagues (Hargis), 563; Natural Law in the Business World, 192; Nervousness (Drayton), 192; Nomenclature in Psychiastry (Parsons), 192; Oxygen as a Therapeutic Agent (Rothwell), 192; Premature Baldness in the United States (Deacon), 382; *The Prophylactic*, 569; *Popular Science Monthly*, 570; Pump Catechism (Grimshaw), 383; *Scribner's Monthly*, 383, 384; Seven Hundred Album Verses (Ogilvie), 191; Six Hundred Medical Dont's (Valentine), 93; Skin Diseases (Fox), 190, 287, 567; Strangulated Inguinal Hernia (Quinby), 192; *Texas Health Journal*, 569; *The Forum*, 384; Trans. La. State Medical Society, 95; Trans. Mo. State Medical Association, 95; Vesical Calculi (Vanderveer), 568; Wasted Sunbeams (Gouverneur M. Smith), 565; Lomb Prize Essays, 572.
Marine Hospital Service, U. S., Annual Report of the Supervising Surgeon-General, Ed., 355.
Mauriac, M.D., Cancer in Medical Examinations for Life Insurance, 24.
Meat Poisoning, Chesney), 412.
Medical Jurisprudence, Mission of the Science of, Hull, 97.
Medico-Legal Society Prize Essays, 96.
McClellan Vent-Trap—Mercury Evaporation, Ed., 545.
McCurdy, J., M.D., Ventilation of Sewers, 244.
Mortality among the Jews, 563.
Mortality in India Caused by Wild Beasts, 335.
Mortality and Morbidity Statistics:
Alabama, 177, 271, 362, 463; California, 79, 177, 271, 362, 463, 545; Connecticut, 80, 178, 273, 364, 464, 547; Delaware, 81, 178, 273, 365, 464, 549; Illinois, 81, 178, 274, 365, 465, 549; Iowa, 81, 180, 275, 365, 466, 549; Louisiana, 81, 180, 275, 366, 466, 549; Maine, 276; Maryland, 81, 180, 277, 367, 466, 549; Massachusetts, 81, 180, 277, 367, 467, 551; Michigan, 82, 180, 278, 367, 467, 551; Minnesota, 182, 278, 368, 467, 553; Missouri, 83, 182, 279, 369, 468, 554; New Hampshire, 279, 369, 554; New Jersey, 183, 279, 369, 468, 554; New York, 83, 183, 280, 369, 468, 554; North Carolina, 88, 372, 472; Ohio, 89, 186, 282, 373, 556; Pennsylvania, 89, 187, 283, 374, 472, 557; Rhode Island, 90, 187, 473; Tennessee, 90, 187, 283, 375, 473, 558; Vermont, 284; Virginia, 92, 188, 284, 376, 559; Wisconsin, 92, 188, 284, 376, 560.

National Board of Health, 358.
Naval Medical Service, Report of the Surgeon-General of the Navy, 1887, 261.
Nelson, E. T., Ph.D., Address before Ohio State Sanitary Association, 195.
Nuisance, Newtown Creek, Ed., 539.

Obituary:
Agnew, C. R., M.D., 479.
Orton, E., LL.D., Address, Ohio State Sanitary Association, 194.
Owens, W., M.D., House Drainage and Sewerage Connections, 238.
Oxygen the Life, Search, 402.

Parker, W. T., M.D., The Tobacco Habit as Viewed from a Scientific Aspect half a Century ago, 126.

Passenger Coaches, Heating and Ventilation of, Reed, 251.
PERSONAL:
Cabell, J. L., M.D., LL.D., 106.
Otterson, W. C., M.D., 86.
Philadelphia and National Quarantine, Ed., 170.
Phthisis, Climate as a Therapeutic Agent in, Lindsay, 26.
Physiology of the Rogue, Abbott, 289.
Poor, New York Association for Improving the Condition of, 269.
Public Health, The House in Relation to, Russell, 35.

Quack Medicines, 140.
Quarantine, Crosse Isle Station, Report, 478.
Quarantine—England's Practice as opposed to Englismen's Precepts, 172.
Quarantine, The New York, Establishment, Improvement of, Report, 3.
Quarantine, The New York, as Viewed by its Officers, Ed., 72.

Reed, C. A. L., M.D., Effects of Present Educational Methods on the Health of Women, 229.
Reed, R. H., M.D., Heating and Ventilation of Passenger Coaches, 251.
Russell, J. B., M.D., LL.D., The House in Relation to Public Health, 35.

Sanitary Cranks and Humbugs, 313.
Sanitary Periodicals, Some New, 172.
Sanitary Science, Duty of the Public to, Collamore, 385.
Sanitarian, A Youthful, Occupation of, 71.
Sanitation in Architecture, Steine, 209.
Sanitation, The Medals, Jetons, and Tokens Illustrative of, Storer, 158, 337.
Scott, W. J., A.M., M D., Necessity of Uniformity in Vital Statistics Reports, 424.
Search, P. W., Oxygen the Life, 402.
Segur, S., Water-Supply of Toledo, 428.
Sewer-Gas and Disease, Ed., 541.
Sewers, Ventilation of, McCurdy, 244.
Simpson, J., Conditions of Health, 390.
Slusser, L., M.D., Cremation as a Sanitary and Economic Measure, 452.
Small-Pox, 76, 189, 284, 378, 379, 473, 477, 548, 554, 560.
Small-Pox in Canada, No, 478.
Smead, J. S., How far has the Science of Ventilation Advanced? 213.
Sonderegger, M.D., International Regulation of Epidemics, 309.
State Medicine, Progress of, Walcott, H. P., M.D., 481.
State Medicine, Proceedings of Section on, 534.
Steine, D. L., Sanitation in Architecture, 209.
Storer, H. R., M.D., The Medals, Jetons, and Tokens Illustrative of Sanitation, 158, 337.
Sulphate of Quinine and the Tariff, Ed., 538.
Syphilis, Should, be made a Legal Bar to Matrimony? Beardsley, 445.

Tobacco Habit, The, as Viewed from a Scientific Aspect a half Century ago, Parker, 126.

Vaughan, V. C., M.D., Foods and Food Adulterations, 396.
Ventilation, How far has the Science of, Advanced? Smead, 213.
Vital Statistics Reports, Necessity of Uniformity in, Scott, 424.
Vollum, E. P., M.D., U.S.A., Diseases Caused by Impure Water-Supply, 360.

Walcott, H. P., M.D., Progress of State Medicine, 481.
Water, Significance of a Sanitary Analysis of, Carmichael, 154.
Water-Supply, Impure, Diseases Caused by, Vollum, 360.
Water-Supply of Toledo, Segur, 428.
Women, The Health of, Effect of Present Educational Methods on, Reed, 229.

Yellow-Fever Facilities at Tampa, 74.
Yellow-Fever in Florida, Ed., 461, 543.
Yellow-Fever Germ—Sternberg's Report, 543.

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